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NATIONAL POLICY AND ISSUES

'JINGJI YANJIU' ON POPULATION GROWTH RATE

HK281245 Beijing JINGJI YANJIU in Chinese No 3, 20 Mar 82 pp 50-56, 66

[Article by Chen Yuguang [7115 3768 0342] of the Economic Research Institute of the Chinese Academy of Social Sciences: "On Some Methodological Problems of Appropriate Population Growth Rate Determination"]

[Text] The question of population growth rate is an important one in a country's population policy formulation and population planning. It is also an important task in a dynamic study of the interrelationship between the two categories of reproduction. The key question for discussion in this article is how to determine and plan for an appropriate population growth, given a set of planned targets for national economic development (such as targets for national income, capital construction investment, the people's living standard, and so on). This article will also preliminarily study certain methodological problems about determining and planning for an appropriate population growth rate in the light of quantitative relationships.

I. Several Points About the Methodology Used

In studying the determination of an appropriate population growth rate, we need to consider many factors, including the constraints on the reproduction of population itself, as well as social and economic problems. However, without social and economic relationships, there would be no human society, and hence no population problem. Therefore, the question of an appropriate population growth rate is one of the interrelationships between population movement and socioeconomic development.

The difficulty involved in a study of this question is that the factors we need to consider affect and limit one another. For example, although the population growth rate is affected by economic development and the people's living standard, the size of population and the population growth rate also limit economic development and improvement in the people's living standard. In the light of the interrelationship, marked by this kind of mutual causality, between population and the economy, we must, in adopting a method of study, follow the principle of proceeding from the simple to the complex, from the abstract to the concrete, and from one aspect to another aspect, followed by summing up. We must thus proceed with our exposition.

First, from the overall and unified process of population movement and economic development, we must pick out for study a certain aspect of the economic development process. In studying it, we assume in the first place that certain factors (such as the technological level, labor productivity, and so on) are relatively fixed, and then try to discover the laws concerning the quantitative relationships between, and changes in, economic development and population growth. In subsequent discussions, we will in the first place study the question of an appropriate limit for population growth, under the condition of expanded reproduction by extension (with an increase in labor force), and we will thus introduce the category of population-induced investment.

Second, in examining the process of economic development as the basic aspect under study, we include in our study certain factors which have not been considered for the time being in the initial stage of our study. We can thus make a comprehensive study to reveal the quantitative relationships whereby the process of economic development limits population growth. In the third part of this article, we will correspondingly study the question of an appropriate population growth rate under the condition of the simultaneous existence of expanded reproduction by extension and expanded reproduction by intensification (with the raising of labor productivity). We will thus introduce the category of economic investment.

Third, population movement and economic development always exist as two aspects of the overall process that embodies the two categories of reproduction. In real life, these two aspects cannot exist independently and cannot be divorced from one another. There are quantitative relationships between these two aspects, and also between them and the overall process. Therefore, the order we must follow in our study is to go from one aspect (economic development) to the other aspect (the population process), and then to make a comprehensive study of both aspects. Thus, proceeding from the overall process involving the population and the economy, we can study the question of an appropriate population growth rate. Correspondingly, in the final part of this article, we will discuss the determination of the appropriate population growth rate for a planned period in the light of the need of economic development, and then examine the possibility of the desired population growth in the planned period in the light of the existing state of the population, so that the need and the possibility can be compatible.

It should be noted that in this article, while our discussion adheres to the above-mentioned methodological principle, we also omit some factors, such as the effect of the differences in the consumption levels of various age groups on the people's average living standard, the effect of economy in the use of materialized labor on the national income growth rate, the effect of changes in the occupational structure of population on labor productivity, and so on. These factors must be considered in the specific determination of the population growth rate, so that more realistic plans concerning population can be formulated. The appropriate population growth rate derived in this article is a quantity which has been derived after taking these factors into consideration. It provides reference for our determination of an appropriate population growth rate.

II. Relationship Between Expanded Reproduction by Extension and Population Growth

The question of population growth rate is an important one in the attainment of an overall balance in the national economy. The actual situation in our country is that over the past 30 years, our population size has been large and the growth rate has been high, so that national economic development has been gravely affected and the disproportion in the relationship between the two categories of reproduction has been aggravated. Therefore, in determining an appropriate population growth rate, we should basically formulate plans concerning population in the light of the actual situation of our national economic development and in the light of the people's daily needs.

Just as the economy, population is a process which involves incessant movements and changes. For a continuously increasing population, its national income must correspondingly increase every year so that the current living standard will not drop. To achieve this increase in national income, we need a sum of capital construction investment to ensure the maintenance of the population's current living standard. We call this the population-induced investment. If expanded reproduction is achieved by extension, with the technological level remaining relatively fixed, and if the population continuously increases, then capital construction investment will consist solely of population-induced investment.

In various planning periods, population-induced investment generally consists of the following two components.

First, with an increase in population, the number of people capable of working also increases continuously. To equip new workers, we must increase our production fixed assets through capital construction. Under the condition of expanded reproduction by extension, the value of the newly added production fixed assets is equal to the number of new workers in the planning period multiplied by the per capita average value of equipment used by workers in the realm of material production during the previous base period.

Second, with an increase in population, to maintain the people's living standard, we must, by means of capital construction, increase the stock of nonproduction fixed assets (such as residential buildings, hospitals, cinemas, and so on). The value of these newly added assets can be determined with reference to quotas for the basic planning period.

These two categories of investment (in the production and nonproduction realms) constitute the specific meaning of what we call population-induced investment in this article. (This article will not discuss the proportions according to which population-induced investment is distributed between the two major categories of material production.)

First, we examine the relationship between population-induced investment and population growth, under the condition of expanded reproduction by extension. We can analyze it by considering the following example. Over the past 30 years, our country's natural population growth rate has been around

2 percent. If the proportions of accumulation and consumption remain unchanged, then, the national income must increase by 2 percent annually if the living standard of the whole population is to be kept from failing. If the national income is to increase by 2 percent, a certain amount of investment is necessary. This amount depends on the value of the investment coefficient. If the value of this coefficient is 3 (the actual average value being 3.18 for our country during the period from 1953 to 1978), then the population-induced investment necessary for bringing about a 2-percent increase in national income will amount to 6 percent of the national income. According to some demographers, when the population-induced investment is 3 to 4 percent of national income, the natural population growth rate should appropriately be around 1 percent; and when this investment is 6 to 8 percent of national income, the corresponding growth rate should be around 2 percent. If the actual growth rate is higher than this theoretical value, the labor resources will not be fully employed, so that the labor productivity will fall; and conversely, if the actual growth rate is lower than that value, the natural resources will not be fully exploited, so that national economic development and the improvement of the people's livelihood will be affected.

This analysis shows that under the economic condition of expanded reproduction being achieved by extension, if other factors are left aside, then in our determination of an appropriate population growth rate, we must consider the rate of investment (as a percentage of national income) and the coefficient of the result of investment.

Generally speaking, if technological conditions remain relatively stable, the rate of investment and the coefficient of result of investment will not vary appreciably within a given time period. Thus, in our determination of an appropriate population growth rate, we will have a rough quantitative limit for reference.

If I stands for the total investment (that is, the population-induced investment), R for national income, K for the investment coefficient, N for the population size in the base period, and Delta N for the increase in population during the planning period in consideration, then the appropriate population growth rate can be expressed as follows: $\Delta N/N$ equals $I/(R \times K)$. Let us call this formula (1). (That is, natural population growth rate equals rate of population-induced investment divided by investment coefficient).

It has been pointed out that when the rate of population-induced investment is around 3 percent, the natural population growth rate should generally be kept at the level of around 1 percent. Considering the actual current situation, our country's natural population growth rate had fallen to around 1.1 percent in 1979, and with the further implementation of birth control programs, the natural population growth rate will continue to fall. On the basis of this consideration, if in a certain number of years the rate of population-induced investment in our country ranges from 3 percent to 2 percent or 1.5 percent, and if the coefficient of investment is 3, then, according to the formula given above, the natural population growth rate will be as in the following table:

Rate of population-induced investment (percent)	3	2.5	2	1.5
Coefficient of investment	3	3	3	3
Natural population growth rate (percent)	1	0.83	0.67	0.5

From this table, it can be seen that in a certain number of years, if the people's consumption level is not to fall, then, corresponding to the four different rates of population-induced investment specified above, the natural population growth rate should be respectively around 1 percent, 0.83 percent, 0.67 percent and 0.5 percent.

With expanded reproduction by extension in mind, we have analyzed and studied the question of an appropriate population growth rate. It should be explained that given that expanded reproduction is achieved by extension, because national income and the available labor force increase in equal proportions, with the labor productivity remaining unchanged, therefore, total investment is equal to the population-induced investment. With a continuous increase in population, although national income also correspondingly increases, the per capita national income still remains unchanged, so that the people's living standard cannot be correspondingly improved. Of course, this situation very seldom occurs in real life. Above is just a method of analysis which helps explain our question.

III. Population Growth Under the Condition of Coexistence of Expanded Reproduction by Extension and Expanded Reproduction by Intension

In the foregoing discussion, when we studied how economic development affects the population growth rate, we left aside the effects of technological progress and changes in labor productivity on population movement. When this study is accomplished, we must then consider the factors we have left aside, so that the rich varieties of specific facts of real life are embodied in the internal relationships between economic development and population growth rate, and also in the quantitative characteristics of these two categories. In the light of this sequence of study, when we have determined the appropriate population growth rate under the condition of expanded reproduction by extension, we must also determine the appropriate population growth rate under the condition of simultaneous existence of the two forms of expanded reproduction mentioned above.

Generally, capital construction investment for effecting expanded reproduction must greatly surpass population-induced investment. Only thus can national income and per capita national income continuously increase and can the people's living standard be correspondingly raised, under the condition that population grows continuously. Out of the total investment, that part which serves to raise the people's living standard, namely, total investment minus population-induced investment, can be called economic investment. If the technological standard is continually raised (implying the existence of expanded reproduction by intension) while the size of population remains constant, then all investment is economic investment. If both categories of expanded reproduction exist, and if the population grows continuously, then both categories of investment exist.

The actual situation of population movement and economic development in the economically developed countries of our times demonstrates that, with the rapid progress of science and technology, the proportion of population-induced investment in total investment continues to diminish, while the proportion of economic investment continues to grow. This is an important sign of zero growth as a trend in population movement and of technological progress. This is also an inevitable trend in the changes in the internal relationships between the two categories of expanded reproduction in human society.

Compared with this process of development which is compatible with natural laws, the changes in the composition of investment (with regard to the two categories of investment discussed above) in our country were wrongly oriented during certain periods.

Let I) stand for the natural population growth rate (in percent); II) for the coefficient of investment (for the sources of investment coefficient data, see JINGJI YANJIU, No 6, 1980, p 27); IIIA) for total capital construction investment as a percentage of national income; IIIB) for population-induced investment as a percentage of total capital construction investment; IIIC) for economic investment as a percentage of total capital construction investment; IVA) as the relative size of population-induced investment if the total investment is taken as 100; and IVB) as the relative size of economic investment if the total investment is taken as 100.

	I)	II)	IIIA)	IIIB)	IIIC)	IVA)	IVB)
1st 5-year plan period	2.38	1.68	13.5	4	9.5	30	70
2d 5-year plan period	0.82	73.7	21.5	60.4	-38.9	280	-180
1963-1955	2.53	0.98	11.4	2.48	8.92	21	78
3d 5-year plan period	2.6	2.32	11.4	6.03	5.37	53	47
4th 5-year plan period	2.18	3.16	14.7	8.20	6.5	55	45

(In this table, according to formula (1) given earlier, the rate of population-induced investment (that is, the proportion of population-induced investment in the national income) equals the natural population growth rate (in percent) multiplied by the coefficient of investment.)

This table reveals that since the founding of the PRC, the proportion of population-induced investment in the national income has increased from 4 percent in the first 5-year plan period to 8.2 percent in the fourth 5-year plan period. (Of course, the situation in the second 5-year plan period was rather anomalous. Although the population growth rate fell markedly, the rate of population-induced investment reached 60 percent and economic investment was negative, because the result of investment drastically deteriorated.) Correspondingly, economic investment declined from 9.5 percent to 6.5 percent between these two planning periods. The proportion of population-induced investment in the total investment has risen from 30 percent in the first 5-year plan period to 55 percent in the fourth 5-year plan period.

To further explain the irrationality of the composition of investment, caused by rapid population growth, it is necessary to briefly analyze the situation of investment in industrial fixed assets in our country.

In economically developed countries, since the mid-1970's, with the progress of national economic modernization, the absolute number of workers in the realm of material production has been decreasing. Out of the total investment in production fixed assets, the investment for maintaining the original standard of equipment for old and new workers has dropped to zero, while investment for raising the standard of the workers' equipment has become the sole cause of national economic development and increase in labor productivity. This change in the composition of investment in fixed assets also reflects a continuous raising of the standard of science and technology as well as a gradual decline in population growth rates, these developments being compatible with natural laws. Contrary to the situation in economically developed countries, the composition of investment in industrial fixed assets in our country over the past 20 years has been irrational. This irrationality is most prominently reflected in the rate of improvement of the standard of workers' equipment, and hence in the rate of increase in labor productivity. At this point, it is necessary to compare and study the situation in our country and in Japan over the past 20 years.

In the table below, let IA) stand for the percentage rate of increase in the number of industrial workers [per year]; IB) for the [overall] percentage increase in the number of industrial workers; IIA) for the percentage rate of growth of investment in industrial fixed assets [per year]; IIB) for the [overall] percentage increase in the investment in industrial fixed assets; IIC) for the relative size of the investment necessary for maintaining the original standard of equipment for old and new workers (this investment being equal to the percentage increase in the number of industrial workers divided by the percentage increase in investment in fixed assets), taking the total investment as 100; IID) for the relative size of the investment necessary for raising the workers' standard of equipment, taking the total investment as 100; IIIA) for the rate of raising of the standard of equipment (this rate being equal to rate of growth of investment minus rate of increase in the number of workers); divided by (1 plus rate of increase in the number of workers) and IIIB) for the rate of increase in labor productivity.

	IA)	IB)	IIA)	IIB)	IIC)	IID)	IIIA)	IIIB)
Japan, 1950-70	3.44	97	14.5	1,400	6.9	93.1	10.6	10.7
China, 1958-78	7.2	306	10.5	640	48	52	3	2.7

(In this table, the figures for Japan are for the entire industrial sector, whereas the figures for China are for that part of industry under the system of ownership by the whole people.)

This table reveals that over the past 20 years, the rates of growth of industrial fixed assets for our country and for Japan did not differ greatly (being 10.5 percent for our country and 14.5 percent for Japan). However, because the difference in the rate of increase in the number of workers was rather great (this rate being 7.2 percent for our country and 3.44 percent for Japan), the proportion of the investment necessary for maintaining the original standard of equipment for the workers, and the proportion of the investment

necessary for raising the standard of the workers' equipment, expressed as percentages of total investment, were respectively 48 percent and 52 percent for our country, but 6.9 percent and 93.1 percent for Japan. Correspondingly, the rate of the rise of the standard of the workers' equipment was 10.6 percent for Japan, being 3 times the figure of 3 percent for our country. The rate of increase in productivity for Japan (10.7 percent) was 4 times the figure for our country (2.7 percent). This analysis shows that the rapid population growth and the large influx of those reaching working age into the stratus of workers seriously hinder the development of the national economy and the raising of labor productivity.

If we say that under the condition of expanded reproduction by extension, there is a quantitative limit governing the determination of the appropriate population growth rate, then, under the condition of the simultaneous existence of both categories of expanded reproduction mentioned above, there is no such limit. Moreover, in the latter case, in determining the appropriate population growth rate, we must not only consider changes in the technological level, but also consider the effects of these changes on the national economy, and hence on the population process; and we must not only consider changes in the people's living standard, but also consider how these changes affect the population growth rate. However, in the former case, in determining the appropriate population growth rate, these factors are considered to be quantitatively fixed.

However, the aim of socialist production is to continuously raise the standard of the people's material and cultural life on the basis of national economic development. This results in the necessity of fixing a rough quantitative limit governing the determination of the appropriate population growth rate. In determining the population growth rate, the primary factor we should consider is the rate at which the people's living standard is to be raised. Generally speaking, this rate should be lower than both the national income growth rate and the rate of increase in labor productivity. When we have set this condition on the rate of improvement in the people's living standard, we can specifically study and compute the appropriate population growth rate in the light of our actual national condition. Since the founding of the PRC, the people's consumption level in our country has risen at an average annual rate of about 3 percent. Suppose this rate is to be 4 percent in the future, and the national income is to grow continuously at a steady rate of 5 percent. (Considering the needs of our national defense construction and the need to guard against the effects of unexpected events on the national economy, it seems that a higher national income growth rate, say, around 6 percent, is more appropriate and realistic.) If national income is to grow at 5 percent, then, to ensure the raising of the living standard of the original population and the increased population (at a rate of 4 percent), we must take 15 percent of our national income (given that the coefficient of investment is 3) as capital construction investment, according to the results of our foregoing discussion. Out of this 15 percent, 12 percent is economic investment (equal to rate of improvement in living standard multiplied by coefficient of investment, and numerically equal to 4 percent times 3), and 15 percent minus 12 percent, that is, 3 percent, is population-induced investment (total investment minus economic investment). Thus, the population growth rate is 1 percent (equal to population-induced investment minus

coefficient of investment, that is, 3 percent divided by 3). (Strictly speaking, it should be 0.96 percent. Because the error is small, it is ignored in this article. The method of calculation is as follows. Take the national income of the base period as 100, and let N be the natural population growth rate of the future planning period. Then, $100(1+N)/(1+4\%)$ equals 105. Thus, N equals $105/104 - 1$, equals 0.96 percent).

According to the discussion above, under the condition of the co-existence of expanded reproduction by extension and expanded reproduction by intension, the formula for the appropriate population growth rate can be expressed as follows:

Delta N/N equals $(I/R \times K) - S$. (Let this be called formula 2.)

S denotes the rate in percentage of improvement in living standard. (If we follow the above-mentioned method of calculation (which gives the natural population growth rate as 0.96 percent), then this formula should be correspondingly corrected. Considering the smallness of the error, we adopt this formula for the sake of convenience.)

The verbal expression of this formula is: the natural population growth rate equals total investment (or, economic investment plus population-induced investment) divided by the product of national income and the coefficient of investment, with the rate of improvement in living standard subtracted from this quotient.

From this formula, it can be seen that if technology advances and population grows continuously, the appropriate population growth rate is mainly limited by four factors, namely, the national income growth rate ($I/R \times K$), the rate of investment (I/r), the result of investment (indicated by the coefficient K), and the rate of improvement of the people's living standard (S). In the determination of the appropriate population growth rate for our country for a number of years in the future, the key question is to estimate and predict the magnitude of these four quantities in the light of our basic national condition.

As to the national income growth rate and the rate of improvement of the people's living standard, both rates must be compatible with our strategic economic aim, namely, to succeed in building a "comparatively well-off society" by the end of this century. Quantitatively, this strategic economic aim, which was put forth by the CCP Central Committee, is to achieve a per capita GNP of \$1,000 by the year 2000, up from the level of \$253 in 1979. If we want to fulfill this aim, our national income must grow continuously and steadily at a minimum rate of 5 to 6 percent. (The average annual growth rate was 7.3 percent from 1950 to 1979, and 6.3 percent from 1953 to 1978. It appears that it will be difficult to have a growth rate of 7 or 8 percent or higher. Concerning this question, we should eliminate the unrealistic illusion of one-sidedly pursuing high targets and high growth rates.) It seems that it is reasonable to strive for a growth rate of around 4 percent in the people's living standard.

According to the foregoing brief analysis of the trends of future changes in our country's rate of investment, result of investment, national income and living standard of the people, that is, according to formula 2, we can determine the appropriate growth rate of our country's population in a number of years to come. If the coefficient of result of investment is 2.5, and if the proportion of total capital construction investment in the national income is 13 percent, 14 percent, 14.5 percent or 15.5 percent, then the corresponding rates of growth in the people's consumption should be 4 percent, 4.5 percent, 5 percent and 5.5 percent. Then, the economic investment, population-induced investment, national income and natural population growth rate will be as in the following table. (In the following table, I) denotes the rate of investment as a percentage of national income; II) denotes the coefficient of investment; III) denotes the rate of improvement in living standard, in percent; IV) denotes the economic investment, in percent; V) denotes the population-induced investment, in percent; VI) denotes the national income growth rate, in percent; and VII) denotes the natural population growth rate, in percent:

I)	II)	III)	IV)	V)	VI)	VII)
13	2.5	4	10	3	5.2	1.2
14	2.5	4.5	11.25	2.75	5.6	1.1
14.5	2.5	5	12.5	2.0	5.8	0.8
15	2.5	5.5	13.75	1.25	6	0.5

(In this table, the economic investment, in percent, equals the rate of improvement in living standard, in percent, times the coefficient of investment. The population-induced investment, in percent, equals total investment as a percentage of national income, minus economic investment, in percent. The national income growth rate, in percent, equals total investment as a percentage of national income divided by the coefficient of investment. The natural population growth rate, in percent, equals the population-induced investment divided by the coefficient of investment.)

From the table, it can be seen that in a certain number of years to come, if our country's total capital construction investment and the people's consumption level change according to the 4 sets of given figures, then the economic investment for carrying out expanded reproduction will be respectively 10 percent, 11.25 percent, 12.5 percent and 13.75 percent; the population-induced investment will be respectively 3 percent, 2.75 percent, 2 percent and 1.25 percent; the national income growth rate will be respectively 5.2 percent, 5.6 percent, 5.8 percent and 6 percent; and the corresponding natural population growth rates will be respectively 1.2 percent, 1.1 percent, 0.8 percent and 0.5 percent.

From this table, we know that if the natural population growth rate exceeds the above-mentioned corresponding levels, then the people's consumption level will not be correspondingly raised. If the natural population growth rate is lower than these corresponding levels, then, although within certain limits, the proportion of economic investment and the people's living standard can be raised, because of the inertia of the existing population situation, the extent of the drop cannot possibly be great.

To sum up the discussion above, we have proceeded from national economic development and the composition of capital construction investment to divide total investment into two parts, namely, population-induced investment and economic investment, and to study them separately. On this basis, we have determined the appropriate population growth rate. This method of study is of great practical significance. The question is not simply one of the method of theorizing.

Given that total investment is fixed, when population-induced investment has been determined, the minimum capital construction investment that is necessary is actually also determined (because population-induced investment is the amount of investment needed to keep the living standard of the original population and increased population from falling). When economic investment has been determined, the upper limit of investment is actually also determined. If total investment has been determined, we can vary the relative sizes of population-induced investment and economic investment, or we can choose any value between the minimum required investment and the upper limit of investment. Thus, in the light of the situation of national economic development and the real situation of population changes, we can increase economic investment to carry out expanded reproduction and to raise the people's living standard, and we can also readjust population-induced investment and appropriately readjust the reproduction of population. The advantages of dividing investment into two categories are that we can prevent the grave malady of high accumulation rate, accompanied by displacement of consumption; and we can bring the two categories of reproduction into compatibility and coordination, enabling them to embark on a benign cycle.

IV. On Achieving the Goal of Appropriate Population Growth

Population growth and economic development constitute an overall process of dialectical unity. The actual population growth rate must be compatible with both the level of economic development and the laws governing changes in the population itself. Only if we understand these laws, can we rationally plan for and determine an appropriate population growth in the light of the needs of economic development. Therefore, we need to proceed from the laws governing changes in the population itself to come to a clear understanding of the principal factors affecting and limiting the population growth rate.

The first factor affecting the population growth rate is the number of people in various age groups and the death rates in these groups. If the number of births remain unchanged, the natural population growth rate varies inversely with the death rate for the population. At present, the death rate in our country has fallen to a very low level. In the future, if there are no major breakthroughs in medicine, the potential of further lowering the death rate is quite limited.

The second factor affecting the population growth rate is the number of women in the child-bearing age group and the fertility rate. At present, the number of women in various age groups and their proportions are a fait accompli. Obviously, the only way to control the future natural rate of population growth

is to lower the fertility rate of the women of child-bearing age. Generally speaking, the readjustment of the fertility rate of women of child-bearing age is confined to certain quantitative limits. Take our country as an example. If the average fertility rate exceeds the level of simple reproduction of population (say, 2.2 to 2.3 children per woman), then, according to information from population forecasts, our country's population will grow continuously at a high rate for many years, and the social and economic consequences will be dreadful to contemplate. If the average fertility rate is to be kept at the level of 1, this will not be acceptable to the masses at present.

These are the upper and lower limits in our planning and determination of the natural population growth rate, if we proceed from the current situation of our country's population. These also serve as lines of alert in our planning and determination of the population growth rate, if we proceed from the needs of economic development. Mastering the above-mentioned limits or conditions governing changes in the population itself will facilitate our balancing and readjustment of increases or decreases in population in the light of two things: the needs of economic development and the possibility of changes in the population itself.

If, in the light of the needs of economic development, the planned and determined population growth rate for the planning period must be lower than the current population growth rate, then, within the quantitative limits governing changes in the population itself, we should correspondingly adopt the method of lowering the fertility rate and control the population growth, so that the population growth rate will fall until it reaches the target determined for the planning period. For example, according to the 4th table above, if in the future the living standard of the people in the country is to be raised at the rates of 4.5 percent, 5 percent or 5.5 percent, then, under the condition that the coefficient of investment is 2.5 and the capital construction investment is correspondingly 14 percent, 14.5 percent or 15 percent, the population growth rate should correspondingly be 1 percent, 0.8 percent or 0.5 percent approximately. Corresponding to these several different population growth rates, we should adopt different schemes of control in our birth control work, proceeding from the current situation of our population. Population forecasts reveal that if the average annual population growth rate is to be maintained at 1 percent until the end of this century, then, from now on (that is, from 1980), the average fertility rate of women of child-bearing age should be 2 children per person. If, in the same period, the average annual population growth rate is to be 0.8 percent, then, the fertility rate should be kept at the level of around 1.7 children per woman. If, in the same period, the average annual population growth rate is to be 0.5 percent, then, we should gradually raise the proportion of families with only one child. This proportion should reach 50 percent in 1985 and over 90 percent by the end of this century. Our party and government have stated that by the end of this century, our population must not exceed 1.2 billion. This requires us to keep the population growth rate for this period under 0.8 percent, and to keep the fertility rate at 1.7 children per woman. We must strive to attain this goal, which is attainable through our efforts.

Lastly, we should clearly state that if the population growth rate, determined according to the needs of national economic development, goes beyond the

above-mentioned levels of alert, then, we should readjust economic development targets related to that determined population growth rate. (These targets include the scale of investment, the coefficient denoting the result of investment, and the rate at which the living standard is to be raised.) Moreover, on this basis, we should plan and determine a new target for appropriate population growth, so that the need of economic development can be compatible with the possibility of changes in the population itself.

The question of appropriate population growth rate is an important one in the study of the interrelationships between the two categories of reproduction. The problem is that there is an overly large difference between the cycle of material reproduction and the cycle of reproduction of population. This article is merely an attempt to study this question. Criticisms on this article are welcome.

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NATIONAL POLICY AND ISSUES

'JINGJI YANJIU' ON AGRICULTURAL MODERNIZATION

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[Article by He Guiting [0149 2710 1656] of the agricultural economics research department of the China Academy of Agricultural Sciences; Xu Xin [6079 6580] of the research committee of agricultural modernization under the China Academy of Sciences; Ling Yan [0407 1484] of the economics research department of the Shanghai Academy of Social Sciences; and Zhang Shilin [1728 4258 2651] of the Beijing Academy of Agricultural Sciences: "On Several Strategic Policy Decisions in China's Agricultural Modernization"]

[Text] Summary: With regard to the problems we have faced in agricultural production due to the long-term implementation of the principle of taking the road of "small agriculture" and "small grains," this article proposes that we should start from the conditions of agricultural resources and the characteristics of agriculture in our country's agricultural modernization and that we should probe suitable methods that have China's own characteristics. This article lays emphasis on three points: 1. The scientific basis for taking the road of "large agriculture." It explains the role of "large agriculture" in fully utilizing agricultural resources, promoting coordination among various agricultural departments, improving the ecosystem, resolving the question of funds for agricultural modernization and finding a way out as regards the labor force. 2. The relationship between the development of the commodity economy of agricultural products and the development of "large agriculture" and the methods for developing the commodity economy. 3. The implementation of a series of measures, in respect of systems and policies, to guarantee the development of "large agriculture."

[End summary]

In studying China's agricultural modernization, we must start from the conditions of agricultural resources and the basic characteristics of agriculture and probe suitable methods that have China's own characteristics in accordance with the major problems we have faced in our agricultural production. Comparatively speaking, the average area of cultivated land for each person is small. But there are many mountains, and the area of water and grasslands is large and the natural resources are rich. Agricultural technology and equipment are backward, but the labor force for agriculture is sufficient. For a long period of time, people have often neglected these characteristics. Therefore, all kinds of problems have emerged in

agricultural production. These include the taking of the road of "small agriculture" and "small food," which confines agricultural production to a small area of 1.5 billion mu of cultivated land. This road is becoming narrower and narrower. Under the conditions that the population constantly grows and the area of cultivated land continues to decrease, multiple cropping indices are usually raised, or forests and grasslands are destroyed for cultivation, or dikes are built to reclaim land from lakes or sea. This has led to the daily deterioration of the ecological environment and slowed down agricultural development. As a result, the commodity rate of agricultural products is low, accumulation capability is poor and there are insufficient funds for expanded reproduction. Some aspects of the agricultural system and policies cannot keep abreast of the development of the agricultural situation. This article is devoted to a preliminary study of the above problems.

(I) Carry Out the "strategy of "Large Agriculture," and Discuss Ways of Using the 14.4 Billion Mu of the Nation's Land

Broadly, the task of China's agricultural production is to use advanced science and technology and industrial methods to display our abilities fully on the 14.4 billion mu of land, fully utilize all agricultural resources and make the ecosystem more rational so as to produce as many agricultural products as possible with the least possible consumption of labor and to meet, to the greatest possible extent, the increasing needs of the society for agricultural products. The realization of this task is directly related to the strategic ideology of "large agriculture" and "large food."

The economic system of "large agriculture" is not merely confined to the production in the spheres of agriculture, forestry, animal husbandry, sideline production and fishery. It also includes the transportation, processing and marketing of these products to rural industry and commerce. "Large food" can be understood as that meeting the metabolic needs of a human body for protein, fat and other nutrition. "Large food" must be realized through "large agriculture."

The emphasis laid on "large agriculture" is determined by the conditions and characteristics of China's natural resources. Of the 14.4 billion mu of land in China, mountainous regions and plateaus account for 4.8 billion mu, the area of usable grasslands is 3.3 billion mu, the area of mountain and slope grasslands is 1.7 billion mu and the area of inland waters and large shallow seas and their beaches is 400 million mu. However the area of cultivated land only accounts for 10-odd percent. Although intensive farming will be carried out on the 1 billion-odd mu of land to provide more agricultural products for the society, the food and wealth that can be obtained are limited if we do not go in for agriculture on a larger scale. By carrying out the principle of "large agriculture," we will be able to bring various agricultural resources into full play on the 14.4 mu of land and produce richer agricultural products to meet the needs of the society.

At present, the average output of meat on each 100 mu of grasslands in our country is only 34 jin, far lower than Australia's 73 jin, Canada's 422 jin and New Zealand's 1,014 jin. We should adopt some measures to improve and utilize our grasslands in the light of China's specific conditions. As for the first step, we should do our best to reach the level of Australia in meat output on grasslands. This will solve the problem of one-eighth of China's meat supply. It will be more ideal if we can exploit mountain and slope grasslands. According to the investigation by Yunhe County, Zhejiang Province, 196 jin of meat can be obtained from natural grazing on every 100 mu of mountain or slope grasslands. If beans or peas are grown and fine breed introduced, the per 100 mu output of meat will be 4,000 jin. If half of the 1.7 billion mu of mountains and slope grasslands is used for natural grazing and the other half turned by man into grazing land, the yearly output of meat will be 35.67 billion jin. In this way, the yearly output of meat from utilizing grasslands and mountain and slope grasslands will be 38.07 billion jin, which will be a 170 percent increase over the total output of pork, beef and mutton in 1979. This can save 150 billion jin of fodder. It will provide 31 jin of meat for each person every year for a population of 1.2 billion people and provide 4.2 percent of the calories, 9.2 percent of the proteins and 11.4 percent of the fat needed by each healthy person every day. If we suppose that the per mu output of grain is 800 jin, the consumption of 150 billion jin of fodder means we can vacate 188 million mu of grain fields for growing other crops that can have greater economic returns. This will be a great turning point for China's agriculture.

The total area of China's inland waters is 400 million mu. Besides, the potential area for inland waters is 500 million mu, of which the area of flooded fields that could be used for breeding fish, shrimps and crabs is 180 million mu, the area of scattered ponds and river swamps is 200 million mu and the area of marshlands that could be changed for developing marine production is over 100 million mu. So the total area of inland waters and potential inland waters is about 900 million mu. But the area of this which is utilized is only 41 million mu, which accounts for 4.5 percent. This only accounts for 41 percent of the 100 million mu which is commonly regarded as the area able to be used for breeding. The per mu output of this breeding area is only 40 jin. The fact that the water area is not fully utilized and that the unit output is low shows that there is great potential for developing freshwater breeding. China's rural areas have rich traditional experience in breeding. There are many typical examples of high-yield breeding in China. One example is pond fish breeding in Hengyang City, Hunan Province, the per mu output of which is 1,400 jin. If the 100 million mu of water areas throughout the country is fully utilized and suppose the per mu output is 400 jin, then the total output will be 20 million tons. If half of the other 800 million mu of water area is utilized and suppose the per mu output is 50 jin, then the total output will be 10 million tons. In this way the total output in fresh water fishery production would be 30 million tons. In addition, the area of shallow seas and beach areas that can be used for breeding is 7.5 million mu. Only 2 million mu is being utilized and this only accounts for 27 percent. The per mu output of kelp grown in the shallow sea area of Qingdao

City, Shandong Province, is 8,000 jin. The per mu output of razor clams bred on the coastal beaches of Fujian Province is 8,300 jin. China's sea fishing is carried out in coastal waters only. Due to long years' of harsh and indiscriminate fishing, fishery resources in coastal waters are facing a crisis. Measures are being taken to change this situation. Even if the volume of sea fishing is limited to 3 million tons, the total output of marine products for the whole year can still reach 40.31 million tons so long as we rationally utilize inland waters, shallow seas and beaches that can be used for breeding. This will also provide 67 jin of marine products per capita each year for a population of 1.2 billion people and will provide 3 percent of the calories, 14.4 percent of the proteins and 4.5 percent of the fat needed by each healthy person every day.

China has vast mountainous regions. Paying close attention to the development of woody cereals and oil-bearing crops has great strategic significance in the utilization of resources in the mountainous regions. Woody cereals and oil-bearing crops have vast adaptability. They can be grown in a very large area from northeast China to hainan Island and from the coast of the east China sea to the foot of the Tianshan mountains. There are more than 200 kinds of woody cereals and oil-bearing crops in China, among which the most commonly seen are Chinese chestnuts, walnuts, persimmons, dates, hazelnuts, rapeseeds, olives, coconuts, oil palms, cashew nuts, yellowhorns, almonds and apricots. They are rich in protein, fat and carbohydrate. A walnut contains as much nutrition as 5 jin of chicken's eggs or 9 jin of fresh milk. [as published] Every 4 taels of walnut kernels can produce 830 kilocalories, which is twice as many as equally important foods can produce. If we utilize mountainous regions and "four besides" and "ten next-toes" land and energetically develop the production of woody cereals and oil-bearing crops according to the characteristics that China has many mountains and enough labor force, everyone can grow one walnut tree and five chestnut trees. Supposing the unit output of walnuts is 100 jin and that of chestnuts is 200 jin, this can provide 34 percent of the calories, 25.6 percent of the protein and 52 percent of the fat needed by each healthy person daily.

According to a rough estimation, we can provide 41.2 percent of the calories, 49.2 percent of the protein and 67.9 percent of the fat needed by each healthy person every day for a population of 1.2 billion people, by fully utilizing our grasslands, mountain and slope grasslands and water areas and firmly grasping the production of woody cereals and oil-bearing crops in afforestation. This will greatly reduce the pressure on cultivated land.

Furthermore, the necessity of carrying out "large agriculture" lies in the fact that it can reflect the internal relationships between various industrial departments and within the industrial departments themselves and the role of these relationships in promoting the rationalization of the ecosystem. For instance, most of the breeding of livestock and poultry is strictly restricted by grain production and the scale of its development is finally determined by the total output of grain. But in some breeding grain is not used for fodder. Take for example rabbit breeding, sheep breeding on

grasslands, cattle breeding, beekeeping and marten breeding. Breeding of milk-goats can also practically be carried out without relying on grain. The development of planting promotes the development of breeding, and in return, the development of the latter provides favorable factors such as organic fertilizer, animal power and funds for the development of planting. The two promote each other and form a beneficial circle. Let us take another example. The relationships of various crops in plant growing and the relationship of various animals in animal breeding are not disorderly. There is law governing them. The correct handling of the relationships between field-consuming crops, autotrophic crops and field-nourishing crops and tree planting and grass growing in line with specific conditions will not only raise the output of agricultural products, but will also be beneficial to improving soil fertility and the agricultural ecological environment. In animal breeding, marten breeding is combined with rabbit breeding in some regions by using rabbits' heads and entrails obtained from the slaughterhouse to feed martens. In some places, silkworm breeding is combined with fish breeding by using silkworm faeces to feed fish. It is obvious that the carrying out of "large agriculture" will enable us to utilize various animal and plant resources according to the objective laws and to raise the economic effect of agricultural production.

The carrying out of the strategy of "large agriculture" and "large food" will guarantee that the people have enough nutrition and calories, by diversifying food and rationalizing the production of food. According to the physical conditions and dietary habits of the Chinese people, a healthy adult should take in 2,400 kilocalories, [as published] 72 grams of protein and 73 grams of fat every day. To reach this nutritional standard, each person should take in the following food each month: 22 jin of processed grain, 28 jin of vegetables and fruit, 13 jin of meat, fish, poultry, eggs and milk and 11 jin of beans, potatoes and sugar. Such an intake of food can only be realized through "large agriculture."

What merits our attention is the role of "large agriculture" in solving the two great problems of funds for agricultural modernization and the way out for the labor force. In developing "large agriculture," industrial sideline production will become a more and more important component part of China's agricultural economic structure. In 1979, the proportion of income from industrial sideline production in the suburbs of Beijing already accounted for 61.1 percent of the total income from agricultural production, the proportion of income from industrial sideline production in the suburbs of Shanghai already accounted for 63.7 percent and that in Wuxi County 70.5 percent. Although these regions have their own special characteristics, they reflect the development trend of China's agricultural economy. This trend is beneficial to resolving the problem of funds of China's agricultural modernization and the way out for the labor force. According to investigations by Taoyuan County of Hunan Province and Wuxi County of Jiangsu Province, these industrial sideline funds account for 27.8 - 78.8 percent of the funds necessary for agricultural modernization. Of course, under the conditions that China is rich in agricultural labor force, we still have to pay attention to the accumulation of labor. We must strengthen the management work,

eliminate waste and pay close attention to economic effect. Funds cannot be accumulated through the exploitation of resources if we lose more than we get.

In the course of agricultural modernization, the characteristic of the change in the consumption of labor in agricultural production is that the proportion of live labor consumed is reduced while the proportion of materialized labor consumed is increased. In this way the productivity is raised. Therefore it is inevitable that the labor force of the plant growing sectors will shift to other sectors. The directional flow of the agricultural labor force in Wuxi County has reflected this trend. From 1971 to 1979, the proportion of the crop farming labor force in the agricultural labor force in Wuxi County dropped from 93.8 percent to 69.7 percent, while the proportion of the industrial sideline production labor force rose from 6.2 percent to 30.3 percent. According to an estimate, after Wuxi County realizes its 10-year plan for agricultural mechanization, the proportion of the labor force in crop farming will drop to 30.7 percent, the other 40 percent will have shifted somewhere else. To where? We can find the answer from the example of Dongting and the other three production brigades of Wuxi County. In 1978, after the four production brigades imported a Japanese paddy field farming machine, they raised their agricultural labor productivity and the proportion of the labor force in crop farming dropped from the original 61 percent to 31 percent in 1980. In the same period, the proportion of the labor force in brigade-run industry rose from 24 percent to 38 percent and the proportion of the labor force in sideline production and other fields rose from 14 percent to 31 percent.

In short, it is quite necessary to have "large agriculture" and "large food" in mind in our agricultural modernization when tapping the potential of the existing crop farming.

(II) Energetically Develop the Agricultural Commodity Economy

Energetically developing the agricultural commodity economy is a great motive force in carrying out the strategy of "large agriculture" and "large food," the road by which the peasants will become well-off and a great strategic measure for raising the level of the productive forces in agriculture and for building socialist and modern "large agriculture."

One manifestation of China's agriculture being backward is that the agricultural commodity rate and commodity volume of agricultural products are extremely limited. The most staple agricultural products are grains, but their net commodity rate is only 15 percent. The commodity rate of agricultural products as a whole is also low. The total purchase volume of agricultural sideline products only account for 32.15 percent of the total output value of agricultural production. If we do not develop "large agriculture" and energetically raise the commodity rate of various agricultural products, the peasants will have nothing to sell. How can they become well-off? How can they have money to buy industrial products? And by what means can they carry out agricultural modernization?

The investigation of 339 production brigades in the rural areas throughout the country in 1979 showed that the prosperity or poverty in the rural areas was, to a great extent, determined by the development of the commodity economy. Of the 339 production brigades, the number of production brigades where each person has an average income of over 150 yuan was 71. In these brigades, the average income of each able-bodied person was 834 yuan, and the average income of each person was 201 yuan. The number of production brigades where each person had an average income of below 50 yuan was 30. In these brigades, the average income of each able-bodied person was 175 yuan, and the average income of each person was 34.7 yuan. The following table shows the relationship between the commodity rate of agricultural products of the production brigades and the average income of each person:

Average income of each person (yuan)		
commodity rate (percent)	201.0	34.7
Percentage of total income obtained from commodities	50.4	18.6
Of this: Percentage of commodity grain in total output of grain	45.0	11.0
Percentage of commodities from industrial crops	92.0	48.6
Percentage of income from industrial crops and of income from forestry, animal husbandry, sideline production and fishery in total income	63.9	39.7

Investigations of the agricultural economy in 11 counties throughout the country in 1980 showed a key link in our agricultural modernization. This is that while taking a firm hold of grain production we must energetically develop industrial crops and a diversified economy of forestry, animal husbandry, sideline production, fishery and industry, change the agricultural economic structure and make agriculture, to the largest possible extent, a commodity industry. Of the 11 counties, Jiading County in the suburbs of Shanghai was the most prosperous. This county raised its commodity rate in two respects. On the one hand, they raised the unit output of crops in an all-round way and did their best to raise the commodity rate of grain and the proportion of total income obtained from industrial crops. On the other hand, they energetically developed industrial sideline production that had nearly all the characteristics of a commodity economy and remarkably increased the commodity nature of their agriculture. In 1979, the total income, compared with 1957, had increased by 980 percent. The commodity rate had risen from 67 percent to 85.6 percent and the average income of each person had increased from 64.6 yuan to 320.6 yuan. Contrasted with this, poor counties and production brigades where the average income of each person was below 50 yuan had, besides bad natural conditions,

a fatal weak point in having a low utilization of land. They did not fully utilize their agricultural resources and develop the commodity production of agricultural products in line with local conditions. Not only was the proportion of industrial sideline production low, but even the proportion of industrial crops in crop farming constantly dropped. It is obvious that only by energetically developing the commodity economy in China's rural areas, can there be hope for agricultural modernization. There can be no exception in any region.

How can we fully develop the commodity economy in China's rural areas?

We must first gradually carry out specialized production and comparatively centralized regional production. This is an inevitable trend in agricultural modernization, as well as an effective way of raising the commodity rate of agriculture. China is a country with a vast territory. Different regions have different natural conditions and social economic conditions, and different animals and plants adapt differently to the environment. The reasons why the carrying out of specialized production and of comparatively centralized regional production can raise the productivity of land and the commodity rate of agriculture are as follows: It can arrange crop farming and animal breeding in the most suitable regions according to the characteristics of animals and plant so that agricultural resources can be fully and rationally utilized; it can enable people to master some aspects of specialized skills and rapidly raise their proficiency in work; and it can promote the development of the processing of agricultural sideline products which have the nature of commodity production. For instance, Fujian, Guangdong and Guangxi Provinces are suitable for growing sugarcane. Their output and sugar productivity are high. In each province or region, there is a great disparity of output between centralized and decentralized planting. In Guangdong Province, in the regions where sugarcane is grown in a centralized manner, 1.7 mu of sugarcane can produce 1 ton of sugar, while in the regions where sugarcane is grown in a decentralized manner, even 3 mu of sugarcane cannot produce 1 ton of sugar. There are now more than 52,000 people's communes in China. Every commune has its own characteristics. They should develop commodity production according to the characteristics of their own resources and meet the needs of the society through exchange of commodities. In this way, we can increase the commodity rate of agriculture as well as the economic effects of agricultural production.

In raising the commodity rate of agriculture, we must strictly observe the law governing the commodity economy. The basic law governing the commodity economy is the law of value. The value of commodities is determined by the labor time needed by the society for the production of commodities. The exchange of commodities is based on value and so it requires exchange of equal values. Commodities can realize their values after being marketed, and the producers can get rational economic benefits. In this way, the initiatives in production can be brought into play and the production of commodities can rapidly develop. Otherwise this production will certainly shrink. This can be proved by innumerable facts. Output in long-haired rabbit breeding in Nanhai County and in riverbank pearl-oyster breeding in

Qingbu County of Shanghai Municipality has doubled in the past few years. The only trick they had was appropriately applying market mechanism according to the law of value. If the role of the law of value is ignored, it is often the case that good resources cannot be appropriately utilized and the production of some commodities cannot develop. For instance, Lishui Prefecture of Zhejiang Province has plenty of mountain and slope grasslands for grazing their cattle and sheep. But the peasants say live sheep are sold to the supply and marketing cooperative at 28 fen per jin, far cheaper than the price of the same quantity of radishes; the price of a cattle is lower than that of a piece of cattlehide. It is difficult for this not to affect the development of cattle and sheep breeding.

In developing an agricultural commodity economy, we must also reform the commercial system of the rural areas. We must break the monopoly of state-run enterprises in the countryside and realize the diversification of the circulation channels of agricultural products. Besides state-run commercial undertakings and supply and marketing cooperatives, communes and production brigades should be allowed to operate trades collectively so as to compete with state-run commercial undertakings and supply and marketing cooperatives in developing the production of rural commodities. In addition, we should, to a certain extent and within a certain scope, bring into play the role of rural fairs. Supply and marketing cooperatives below the county level should be restored as commercial undertakings which are collectively owned by commune members in the true sense of the words, in order to make more contributions to the development of the commodity economy in the rural areas. Whether they are state, collectively or individually owned, commercial undertakings should energetically link up production and consumption, promote production and open up the road for marketing agricultural products of a commodity nature.

Furthermore, we should strengthen market analysis and the study of commercial information and learn well how to use economic information to guide production. Of the innumerable native products in China's rich mountainous regions and inland waters, many are famous brand goods in the international market. We should lose no opportunity to enable these products to come to fame and to increase their marketing on the international market. But, because commercial information and market analysis lag behind, many agricultural resources are discovered by foreigners first. They introduce a fine variety and force their way into the international market. Domestically, some other goods are often stockpiled or unsalable, and we cannot but restrict their growing or collection. For example, Mihou peaches that grow wild everywhere in the mountainous regions in the subtropical zone of south China are rich in nutrition. New Zealand named them "China Mihou peaches" after introducing a fine variety into the country from China. Now they have occupied the international market. But even now, the purchase of these peaches in the Zhenan mountainous region has not started. China's goat hair, which is specially used for making drawing and writing brushes, is badly needed in Japan and other South-east Asian regions. But no one takes up the work of purchasing this hair in the Zhenan mountainous region. Quite often, the value of natural resources only becomes gradually known by people following the development of science

and technology. Therefore, commercial departments, economic information departments and scientific research institutions are required to carry out research together to constantly raise the utilization level of natural resources. In Guizhou Province, there is a kind of wild thorny pear, every 100 grams of which contains 2,454 milligrams of Vitamin C. Even the same quantity of "China Mihou peaches" which are called the vitamin king only contain 1/5 as much Vitamin C as thorny pears. The Vitamin C contained in oranges is only 3 percent of that contained in thorny pears. But very few people know about this treasure. Many valuable medicinal herbs, wild spices and exotic flowers and rare trees have not been exploited. Therefore China's peasants, commercial personnel and scientific research personnel are required to explore the possibilities. If rural natural resources which have their own characteristics are fully exploited, the role of China's agricultural commodity economy in agricultural modernization will be immeasurable.

(III) Guarantee the Development of Socialist Modernized "Large Agriculture" in Systems and Policies

Some of the management systems and policies in China's agricultural production have been gradually formed to meet the needs of unitary grain production. Therefore, in building comprehensive modernized "large agriculture" which is of the commodity nature, in many aspects they are not suitable. They must be readjusted and restructured. What to readjust and what to restructure and how to readjust and restructure are complicated problems which must be seriously studied. But some are obviously irrational, have seriously restricted the development of the commodity economy in the rural areas and are detrimental to the realization of the principle of "large agriculture" and "large food." These must be rapidly restructured.

First, we must restructure the management system and institutions in agricultural production. China has a vast territory and complicated terrain. There is great disparity in the natural and economic characteristics between different regions. Different regions have different orientations in production. If, in all cases, we take agriculture as the dominant factor in the organization of, and the allocation of personnel in, the production management structure, it is obvious that it will not be able to meet the needs of "large agriculture" and "large food." For instance, some regions are surrounded by sea and the inhabitants on the islands have always relied on fishery for a living. The output value of fishery accounts for over 50 percent of the total output value of agriculture. But the production management structure is the same as that in other counties that have agriculture as the dominant factor. The number of personnel in the aquatic products bureau is far less than that in the agricultural bureau. The utilization of natural resources is not even. The people say that what 1 mu of land should be sown with and how much should be produced have to be decided by the management structure. A waste of a mu of cultivated land is a serious matter, but no one bothers about the waste of tens of thousands of mu of water and mountainous areas.

The forms of organization in production should comply with the requirements of the development of production and should not be restricted by different administrative divisions. Many large and medium-sized lakes, reservoirs and rivers extend across different administrative regions. But our production management institutions are based on the administrative system. This has brought many difficulties to the rational utilization of transregional resources. Take the situation in some lakes for example. No one is willing to put fry into the lakes, but when it comes to fishing, every household scrambles for that. It is obvious that the undermining of resources is related to organizing production according to the administrative system. It is necessary to break the administrative demarcation and organize different forms of joint management in line with specific conditions according to the characteristics of transregional resources.

Comprehensive institutions have to be set up in some places so as to make it convenient to organize and manage the comprehensive utilization of natural resources in agriculture. Generally our production management institutions have clear divisions of specialization. But the rational exploitation of natural resources should be comprehensive. In mountainous regions, where is the suitable place for grazing, afforestation and grain production? In coastal areas, where is the suitable place to build dikes to reclaim land from the sea? What are the favorable conditions for breeding? How to consider the balance of organisms' habits as well as the economic effect? All these questions must be comprehensively investigated, planned, utilized and managed. These requirements must be fulfilled organizationally.

Second, we must develop agricultural, industrial and commercial joint enterprises. The essence of the economic system of modernized "large agriculture" is the comprehensive development of agriculture, industry and commerce. Practice has proved remarkable results can be obtained if this principle is followed. This is because the potentials of agricultural resources are very great. If everything is carried out exclusively by state-run industry and commerce, it is often the case that resources cannot be fully utilized. Because there are price scissors between industrial and agricultural products, it will be very difficult for agriculture to get rid of poverty if it is always to supply raw materials for industry. Take pearls and rabbit hair for example. Although they can create high exchange rates, at present they are exported mainly unprocessed. If pearls are processed into handicraft articles and medicinal materials and rabbit hair into textiles and clothes, we can not only greatly increase the income in the collective economy and allocate some surplus labor force, but also make exchange rates higher. This is beneficial to our country. Of course, in developing such processing trades, we must pay attention to solving in an all-round way the problem of scrambling for raw materials with large industry and energetically raise the level of production and the economic effect.

Third, we must reallocate the investments in agricultural capital construction. In the past, the stress of investment in agricultural capital construction was always laid on water conservancy projects. Investment in water conservancy projects accounted for most of the investment in agricultural capital construction as a whole. At present, the effective irrigated

area of fields throughout the country is 670 million mu, of which 340 million mu are stable and high-yield fields despite drought or excessive rain. This has played a great role in increasing grain production in our country, but the economic returns from the investments in water conservancy projects have dropped each year. The amount of investment in each additional mu of effective irrigated fields was 77 yuan on the average from 1952 to 1957, and it rose to 132 yuan from 1970 to 1977. It will become more and more difficult to expand irrigated land, and the economic returns from investments will become worse. We have vast grasslands, grass mountains and slopes and inland water areas. But in the past little investment was put into the exploitation of these resources. Viewed from the angle of developing "large agriculture" and "large food" so as to enable the state investment to more effectively promote the development of agricultural products of a commodity nature, we must raise the investments in mountainous regions, lake areas and grasslands to a certain proportion.

Fourth, taxation is not only an important source of state revenue, but has always been the government's economic lever for promoting or restricting the production of certain products. The speed in the development of a diversified economy in agriculture is also related to taxation policies. The agricultural tax rate in our country is much lower than the industrial tax rate. Under the present circumstances where the "price scissors" are large, if the policy of little tax paid at multiple collections is further implemented, it will play an excellent role in promoting the production of many agricultural sideline products. In 1978, the state carried out in Zhejiang Province the policy of tax reduction and of exemption from turning over profits to the state. In 1980, tea output in this province increased by 60 percent over 1976. It has been made public throughout the country that the policy of tax reduction and of exemption from turning over profits to the state will be carried out in tea-producing units which can overfulfill production tasks. This will give an impetus to the rapid development of tea production in our country. This policy should also be carried out with other agricultural products of a commodity nature. Following the carrying out of this policy, production has developed and the state's total taxation has increased. In 1978, the tax rate for agriculture in the suburbs of Beijing dropped by 1 percent compared to 1965. But the amount of agricultural taxes obtained increased by 83 percent. This is a typical example.

Fifth, special undertakings must be dealt with by special methods. In the whole chain of agricultural production, some links are indispensable, but under the present conditions, we sometimes cannot make money and even incur losses in running certain undertakings. Take for example, the running of the agricultural machine-building industry and of the fodder industry, the exploitation of mountain and slope grasslands and of large reservoirs and breeding of fry in rivers. Because we cannot make money or even will possibly incur losses in these undertakings, we have not started running them, or, although we have started running them, they are very backward and cannot develop. These blank and backward undertakings are restricting the development of "large agriculture." Therefore we must regard them as special undertakings in regard to policies concerning investment, taxation

and the turning over of profits to the state. If the agricultural machine-building industry makes more money, it means that more expenditure is being made on agriculture. If it makes less money, they are afraid that they will not be able to fulfill the financial tasks entrusted to them by the state. So they dare not use new techniques, new designs and new materials in agricultural machine-building so as not to make the prices of agricultural machinery excessively high. As a result, the quality of agricultural machinery remains low. There are more difficulties in the fodder industry. For the manufacture of full-value fodder or mixed fodder, processing is needed. But if we carry out processing, the production cost will be passed on to breeding trades, and the production cost of husbandry and marine products will rise. Particularly under the condition that our country is short of fodder grain, we must still use vegetable peel, fruit peel or shells, straw, vine leaves, swill and urban rubbish as raw materials for the fodder industry. Originally these things are not valuable, but as we have spent money processing and utilizing them we must sell them. Thus, people would rather use them directly as fodder rather than processing them, and so the expected effect in breeding cannot be obtained. In addition, the peasants in densely populated regions should be encouraged to move out and support the peasants in mountainous and remote regions in living in peace and working in contentment. This is also a special cause. Special policies must be made to solve these problems.

Sixth, we must pay attention to bringing into play the initiatives of the peasants in grain production. Grain is under the first category plan. The better the production conditions are and the higher the output is, the heavier the tasks for fulfilling the state plans will be. If the cost of other production projects is high, it is still possible to make some changes. But the case is different with grain production. The tasks have to be carried out even to fulfilling the last jin, even if losses are incurred. Even though the tasks assigned by the state remain unchanged for several years, following the growth of the rural population and the development of breeding trades, the production tasks of communes and production brigades are actually increasing year by year. Particularly under the conditions that a diversified economy and commune and brigade-run enterprises can develop fully, grain producers are at a comparative disadvantage. Therefore, grain production in many regions has not only become a heavy burden, but also made it impossible to utilize the land rationally. This cannot but affect the development of the agricultural commodity economy. In 1979, of the 14 counties in the suburbs of Beijing, the 4 which had the lowest distribution level were grain producing counties that could provide the most commodity grain and where each person had over 2 mu of land on the average. Grain is the foundation of agricultural production. The development of many production projects in agriculture is directly or indirectly restricted by the level of grain production. It is therefore necessary to pay special attention to protecting the initiatives of the peasants in grain production when making plans for developing agriculture as a whole.

There should be a process in the development strategy for realizing "large agriculture." Firstly we must solve the problem of understanding and secondly we must implement the policies concerned in line with specific conditions. The speed of China's agricultural development will be determined by the speed of solution of these problems.

CSO: 4006/408

CONSTRUCTION

'JINGJI GUANLI' ON CAPITAL CONSTRUCTION INVESTMENT

HK230943 Beijing JINGJI GUANLI in Chinese No 3, 15 Mar 82 pp 24-25

[Economic commentary by Kang Zhixin [1660 1807 2450]: "Strive To Increase the Economic Returns on Investment in Capital Construction"]

[Text] In 1981 our state made new progress and scored better results in capital construction after a further step was taken in readjusting the national economy. The longstanding problem of the construction line being too long is being resolved. The use of investment is now more rational than in the past and the focal point of capital construction work has begun to shift from the reduction of the scale of construction to the upgrading of the economic returns on investment.

Planned control was basically realized once the scope of capital construction was substantially reduced. In 1981 the total investment in complete capital construction throughout the country was 41.7 billion yuan, 12.2 billion yuan (22.6 percent) less than in the previous year. Construction of more than 100 medium and large scale projects and more than 1,000 small-scale projects was suspended for the year. In addition to the reduction of the scale of construction of the preceding 2 years and the clearance of unfinished projects, the state axed more than 1,000 medium and large scale projects and more than 9,000 small scale projects under construction. More than 50 billion yuan of investment was cut from unfinished projects. This had great significance in maintaining a balanced budget and the balance of the national economy.

The structure of investment has been rationalized since the use of investment was highlighted. The reduction of the scale of capital construction and the readjustment of the industrial structure are being carried out side by side. Investment in the light and textile industries, the main producer of consumer goods for everyday use, went up form 8.1 percent of the total investment in 1980 to 11.4 percent. Investment in heavy industry dropped from 46 percent to 42.8 percent of the total investment. Construction in the weaker links of heavy industry such as the energy industry, the building materials industry and communications and transportation was strengthened. Investment in production construction was reduced by 31.4 percent of the total investment compared to that of last year. Investment in nonproduction construction, which is closely related to the people's livelihood, rose from 34 percent of the total investment of last year to 41.3 percent, the highest proportion ever achieved since the founding of the PRC. Under the condition of reducing the scope of construction, investment in municipal residential construction

still increased by 200 million yuan. The proportion rose from 20 percent of the previous year to 26 percent. Total residential area completed in the year was 75 million square meters, nearly reaching the level of the previous year. According to a survey conducted at the end of November 1981 in eight cities including Tianjin, Shanghai and Shenyang, on about 3/4 of the completed residential flats, the main construction had been completed, renovation and furnishing has been carried out simultaneously and, upon completion, residents had moved in within the year. This was a good phenomenon which has been paid to education, science culture, public health, public utilities and urban construction. The proportion of investment in them has been increased. Meanwhile, the housing construction program in the rural areas has also been included into the important agenda of the state and it has been making rapid progress.

A batch of major projects which has significant effects on the national economy has been completed and put into operation. Sixty-six large and medium-scale construction projects and 168 individual projects were completed and came into operation in 1981, an achievement which has not been seen for many years. Phase 1 of the Gezhou dam major hydroelectric power station project on the Changjiang has been completed. The gate is open to navigation. Electricity has been formally generated by station one. The 1.7 meter rolling mills of the Wuhan steelworks were checked and accepted. The Xinlongzhuang coal mine, in Yanzhou, Shandong, with an annual output of 3 million tons, formally came into operation. Three major chemical fiber factories in Liaoyang, Tianjin and Sichuan were completed and put into operation. Our capacity for coal mining increased by 50 percent compared to that of last year. The total capacity for electric trains has increased by more than 2 million kilowatts. The capacity for oil extraction increased by more than 5 million tons. These great achievements in construction are significant to the present readjustment period which demands a constant growth in production as well as to the stable and rapid development of the economy.

Improve the management work of capital construction. In light of the readjustment of the scale of construction, technological and economic studies of stagnant projects were carried out in 1981. Bases for stagnant projects were provided. The practice of leaders having the final say has been changed. Attention has also been paid to planning work. Summing-up and assessment work has been widely carried out. Outstanding planning work in the 1970's was praised. The country has also laid down regulations to award significant and high-quality construction projects and enterprises which have completed outstanding and high-quality projects. The Handan city No 2 construction company was a model which made an overall improvement of economic effect and was particularly popularized. It was significant to the construction of construction brigades and the readjustment of enterprises. At present, the construction enterprises in the country are starting to follow the example of Handan city No 2 construction company one after another. Various economic responsibility systems have been introduced and reorganization work has been carried out. The experiments of changing from allocation to loans for investments in capital construction, carrying out the economic contract system, running planning units along the lines of enterprises, increasing the autonomy of the construction units and commercializing construction goods, which have been carried out for 2 years, have shown new development. Some of them are already fully under way.

In a word, through readjustment, construction projects were reduced, the overall scale of construction was cut back and brought under control, and the processing industry of heavy industry was regulated. The light and textile industries and residential construction, which are closely related to the people's livelihood, have been improved. The management of capital construction has also been improved.

However, the work of readjusting the capital construction front in future is still very heavy. Construction in the weaker links such as energy, communications, mining, construction materials and public utilities requires further improvement. Furthermore, as the scale of construction of other aspects is still too large and is incompatible with the finance and resources provided by the state, construction projects blindly carried out by many localities and departments should be further clarified. From now on, while we are cutting down and controlling the scale of capital construction, we should also make effective use of our construction capital to reduce waste and to enhance the economic returns on investments. The reason is that the speed of economic development of a state depends not only on the amount of investment, but also on whether the investment is used effectively. People often generalize about the problems within the area of capital construction as follows: "The construction front was too long; the use of finance, resources and manpower is scattered; the management is chaotic." In fact, "long, scattered and chaotic" are only the phenomena. The crux of the problem is that the return on investment is poor and that the loss and waste is too serious. Waste is mainly due to the long period of construction. If the construction period of the current projects is prolonged for 1 year, the expenditure of wages for construction brigade workers increases by several billion yuan. The state loses several billion yuan of profit tax as a result of the prolongation of the handover, operation and use of construction projects. In light of the reduction of the present scale of construction, the key to and the major policy of enhancing the economic effect of the current capital construction is, therefore, to strive to shorten the construction period.

The factors for the prolongation of the construction period during these years have been analyzed. The following should be done to resolve the problem:

1. Rationally determine the scale of construction and strike a comprehensive balance. Insist on linking up the control of construction projects, particularly large and medium-scale projects, with the reduction of the total amount of investment in projects under construction. Comprehensively shorten the average construction period of the current capital construction. It is, therefore, necessary to reexamine the planning of current projects and to cut down those which are not urgent and which lack construction conditions. Some projects can be carried out phase by phase. "Bundles" of projects should be unraveled, so that individual projects can be completed, put into operation and make profits earlier. With regard to projects which are really necessary and have been under way for many years, the conditions should be created to complete them within the period of the Sixth 5-Year Plan. We should gradually arrange the projects and make investments year by year according to a reasonable construction period and draw up a plan for capital construction, so as to ensure the continuity of construction, the handover and operation as scheduled.

2. Strengthen the policy on projects and carry out feasibility studies. The policy on projects should be drawn up on the basis of thorough studies, technological and economic examinations and the comparison of the feasibility of various plans. After the projects have been determined, the main effort should be put on enhancing the quantity and quality of the plans and on summarizing examinations to ensure the technological advancement and economic rationality of construction projects.
3. Extend the area of changing from allocation to loans for capital construction and make use of repayable investments. As for the use of loans, the unity of "borrowing, using and repaying" should be achieved. A definite responsibility system enables the method of loans to achieve the speeding-up of the construction period and the period of recovery of investment.
4. Further carry out the economic responsibility system. Speaking from the urgent need of enhancing the returns on investment, the responsibility system should be introduced to various stages of construction, and to various links in length and breadth, so that a network of responsibility systems can be formed. For instance, to set up and implement the system of responsibility for the policy on projects. Policymaking institutions of various localities, departments and levels should form an overall policy system. Responsibility should be shared among various levels. Set up the system of responsibility for using repayable investments in capital construction. Set up the technological-economic responsibility system for consultancy firms and planning units, the economic contract system among the units which are related to construction and the system of sharing responsibility in construction enterprises. In this way, the shortening of the construction period will become practicable in all aspects.
5. Reorganize vigorously the construction enterprises and construction brigades. Only when we strive to improve the management standard, to set up targets for the construction period and to organize construction work scientifically can we improve our efficiency and acquire a good reputation. At the same time we should set up an overall contract system and reorganize the management system of the construction headquarters.
6. Perfect the regulations and the system of capital construction and strengthen the economic legislation and judicature, so as to shorten the construction period and enhance the returns on investment. In this way, people can follow the laws and regulations imposed on them. A system of rewards and punishments will be introduced. Those who commit an offence against the law will be prosecuted.

We believe that, through the concerted efforts made by the cadres and workers on the capital construction front, the economic returns on investment in our capital construction will certainly be enhanced and a new contribution will be made to the development of the national economy.

FOREIGN TRADE

POSITION IN INTERNATIONAL TECHNOLOGY TRANSFER DISCUSSED

Beijing CAIMAO JINGJI [FINANCE, TRADE AND ECONOMICS] in Chinese No 1, 10 Jan 82 pp 42-45

[Article by GUO XINCHANG [6753 0207 2490] and YANG HAITIAN [2799 3189 3944] of Tianjin College of Finance and Economics: "China's Unfavorable Position in International Technology Transfer Should Be Changed as quickly as possible"]

[Text] The transfer of technology is an important activity in contemporary life. Today, with countries depending increasingly on science and technology for economic development, no country can do without the transfer of technology. For its four modernizations program, China should certainly take an active part in international technology transfer, but it should sum up its experience in this area since the founding of the People's Republic and take appropriate measures to change its unfavorable position in this transfer as quickly as possible.

Technology Transfer in Today's World

I. Form and Direction of Flow

Technology transfer takes many forms. The three most basic forms are: 1) Transfer through physical equipment, construction engineering, complete plants, etc--material form of transfer; 2) transfer through patents, technical secrets, basic designs, etc--information form of transfer; and 3) transfer through the flow of scientific and technical manpower--transfer of talent or "scientific brain," as it is called abroad.

1. Technology in the material form flows mainly from developed countries to developing countries, and consists mainly of second-rate "intermediate technology". At present, because of the rapid development of science and technology, technology incorporated in physical equipment may be quickly outmoded. Developed countries, after they have developed a new technology, usually transfer the relatively backward technology to countries abroad, so as to avoid continued losses from outmoded equipment. And "intermediate technology" is what most of the developing countries need most because of their limited ability to absorb imported technology. Thus the physical form of transfer is still the main form of transfer today, and the direction of flow is mainly from developed countries to developing countries.

2. Technology in the form of information flows mainly among developed countries. This type of technology is generally in a preproduction experimental stage and is much more advanced in nature than the material form of technology. Its transfer is also called technology trade, which has already reached a volume of \$10 billion annually. Although not as large as the volume of material technology transfers, it has grown rapidly and is having a great impact on economic development. In the world trade in this type of technology--limited up to now to developed countries--the United States is the leading exporter, the ratio between exports and imports being about 10:1. Japan and West Germany are the leading importers, the ratio between exports and imports being 1:5 and 1:3 respectively. Exports and imports are in overall balance for the United Kingdom and France, as they are for this group of developed countries as a whole.

3. Technology as embodied in scientists and engineers flows mainly from developing countries to developed countries. Scientists and engineers are the prerequisite for the development of science and technology. Their normal flow between countries contributes to this development and is especially needed by developing countries. But taking the world as a whole, the flow is not mainly from developed countries to developing countries but from developing countries to developed countries. This is especially true among immigrants. An article in the French weekly DIPLOMATIC WORLD in March 1981 pointed out that during the period 1961-1975, about 400,000 experts emigrated from developing countries to industrialized countries. Among them 220,000 were engineers and technicians. The United States, Canada and the UK are the main beneficiaries of this brain drain. For example, 70-80 percent of the technical personnel flowing into the United States came from the Third World. According to an estimate by UNCTAD, in 1971-1972 the inflow of talent from the Third World into the three countries mentioned above represented a capital inflow of \$42 billion.

II. Reason

Why has such an unreasonable flow taken place in international technology transfer? There are many reasons. The most basic reason lies in the uneven economic development of the countries of the world. Economies at different levels of development have different absorption capacities for scientific and technological advances and have different requirements for scientific and technological development. The basic facilities for training scientists and engineers and for developing and using scientific and technological advances are also different. In the early seventies, the scientific and technical personnel of the United States, the USSR, Japan, France, Britain, and West Germany combined amounted to 70 percent of the world total, and the investment of these countries in scientific research was 85 percent of the total. In comparison, the countries of Asia, Africa and Latin America had less than 13 percent of the world's scientists and engineers and less than 3 percent of the world's total investment in scientific research. In 1979, the United States spent \$200 per capita for scientific research, the Latin American countries spent less than \$5 capita, and the underdeveloped countries of Asia and Africa spent less than \$1 per capita. Industrially developed countries have a powerful economic and technological base; they can produce more inventions and quickly absorb the most advanced scientific and

technological developments of the world. They can transfer technology from abroad. In comparison, most of the developing countries have a weak economic base; their scientific and technical personnel as well as their production personnel have generally poorer skills. They have limited scientific inventions and substantial difficulty in absorbing quickly the imported technologies. So they have to rely mainly on buying readymade equipment from abroad with an enormous outlay of funds. This is why the transfer of information technology is mainly confined to developed countries and why the physical forms of technology flow mainly from developed countries to developing countries.

Another important reason for talent to flow from developing countries to developed countries is the uneven development of science and technology in the world. Because developed countries have a powerful economic base, their scientific and technical personnel enjoy much better working conditions and higher living standards than do their counterparts in developing countries. The fact that scientific and technical achievements are transferred on the basis of compensation and in the form of patents is a great attraction for scientists and engineers in the Third World. On the other hand, importing mainly readymade equipment into developing countries has not helped the full development of the capabilities of their scientists and technicians. This is another important reason for the brain drain of the developing countries. In addition, there is also a policy factor. Industrially developed countries use various ways to attract and compete for scientific and technical talent of other countries. They revise their immigration laws and relax restrictions on immigrants from developing countries. They use legal provisions and higher material rewards to cut the ground from under their competitors. In contrast, developing countries often pay attention only to promoting direct material production and remittances from expatriates, failing to come to grips with the serious effect of the outflow of their scientific and technical manpower. Some countries even adopt policies that are harmful to the development and use of their scientific talent. This is another reason for the brain drain of the developing countries.

III. Consequence

The unreasonable direction of flow in international technology transfer has brought grave consequences to scientific development in developing countries and in the world as a whole.

First, the brain drain has weakened the very foundation of scientific and technological development in the Third World. Take Egypt, for example. In the period 1962-1979, more than 60,000 scholars went abroad to work. The country received some \$2 billion in overseas remittances every year, which became an important source of national revenue. But the drain of so much talent seriously affected the country's scientific and educational development. The number of faculty members in the colleges and universities of the country were reduced to 6,000--only one-tenth the number who left the country. Today many developing countries are taking note of the gravity of this problem, calling it a "brain drain crisis" and "talent outflow explosion."

Second, importing readymade technical equipment over a prolonged period has made developing countries more reliant on industrially developed countries. For example, during the sixties and seventies, India signed an average of over 400 contracts every year mainly for the import of equipment. The United States, the USSR, the UK and other countries took advantage of this situation to increase control over the country's technology, with the result that India's scientific and technological development has become very disoriented.

Finally, confinement of the flow of advanced technology to developed countries has led to a monopoly by a few countries over advanced science and technology, which has impeded the flow of science and technology from advanced areas to backward areas and aggravated the uneven economic development of countries of the world. According to estimates of publications abroad, for every \$1 increase in wealth of developing countries, developed countries can have an increase of \$268. This discrepancy will undoubtedly continue so long as the monopoly of the great mass of advanced technologies by a few developed countries remains unchanged.

China's Position

Like most of the other developing countries, China is in an unfavorable position in international technology transfer.

First of all, China's imports have always been mainly in complete plants. According to statistics, of the total of \$14.5 billion in China's technological imports in the period 1950-1979, complete plants accounted for about \$13.5 billion (including interest), or 93 percent of the total. The import of information technology was less than \$200 million. Even adding the royalties, design fees and service charges involved in importing complete plants, it was less than 10 percent of the total.

The massive import of complete plants has significantly helped lay the foundation for China's industrial development and improved the technical equipment of certain sectors. But it has also brought some adverse effects. Spending large sums of money over a long time on importing complete plants has to a certain extent weakened domestic investments in scientific research, making it more difficult to increase domestic capabilities for development. Confining the country's effort to the absorption and duplication of imported equipment over a long time has also had a negative effect on the creativeness of the country's scientific and technical personnel. China's expenditures on imports over the past 30 years have not been lower than Japan's, but the overall development of science and technology in China has not been as successful as that in Japan. Through technological imports, Japan has succeeded in establishing a scientific and technological system with Japanese characteristics. Although China has established an independent and complete national economic system, it cannot be said that it has set up an independent and complete scientific and technological system. The difference lies in that Japan from the very beginning gave priority to strengthening investment in human resources and the improvement of Japan's own ability to develop while importing foreign technology. The ratio of its expenditures on imports and on scientific research was about 1:7. As its domestic capabilities to develop

increased, its imports gradually changed from equipment to patents (now changing further to the buying of laboratory technology and the reciprocal exchange of technology), and the country has gradually moved from a technology importer to a technology exporter. In comparison, we have neglected to establish a scientific and technological system of our own; the ratio between our expenditures on imports and on scientific research has been generally 1:1. Being unable to quickly raise our own ability to absorb and develop, we could only continue to import mostly equipment. If nothing is done to change this, it will become a vicious circle.

Furthermore, with equipment as the main import over a long time, plus the tendency to "lean to one side", one can easily come under others' control. For example, during the fifties, we imported equipment mainly from the Soviet Union. By the end of the fifties, when relations between the two countries deteriorated, the Soviet Union immediately tore up contracts, withdrew their experts and took away construction drawings, creating great difficulties for us. In the sixties we turned to West European capitalist countries for technological imports. In the seventies China established diplomatic relations with Japan and the United States, and began to import technology mainly from these two countries. All through these years we have been under some kind of technological control by one country or another. In 1978 and 1979, we signed a large number of project contracts with Japan, some of which were ill-advised because they went beyond our ability to absorb or to pay. When we were forced to initiate negotiations for the cancellation of contracts, some Japanese firms demanded damages and put pressure on us. Not only did we suffer economic losses, but our international reputation suffered as well.

China is also suffering from a brain drain. Take the city of Tianjin, for example. From 1976 to August 1979, among returned overseas Chinese and those who have relatives abroad, more than 1,100 persons left the country. A substantial number of college students of the pre-"Cultural Revolution" period also applied to leave the country. One domestic reason for this brain drain is that in some departments and enterprises, the party's policies on intellectuals have not been fully put in effect. An important external reason for this brain drain is the competition for talent by industrially developed countries. We must take serious note of this situation. If this brain drain is allowed to go on, it will not only weaken the domestic foundation for scientific and technological development, but will have a demoralizing effect on the scientific and technical workers in the country as well.

How To Change the Unfavorable Position

In light of the lessons learned by some countries and the special conditions in our country, the most important steps for us to take to change China's unfavorable position in international technology transfer are as follows:

1. Controlling the outflow and encouraging people to return. This was the policy of the initial period of the founding of the People's Republic, and it played a positive role in the restoration and subsequent development of the national economy. At present, as we are taking further steps to correct the "leftist" mistakes and implement policies on intellectuals, we should

restore this correct policy of the fifties. First of all, we should take certain steps to strictly control the outflow of talent and encourage the broad ranks of scientific and technical personnel to love their present work, to bring glory to their motherland, and to make contributions to the four modernizations. At the same time, we should make use of various channels to encourage those scientific and technical persons abroad who love the motherland and have real talent to come back and contribute their part to the rejuvenation of the country.

2. Taking into account Chinese conditions and importing technology on multiple levels and through multiple channels. To avoid the problems created by prolonged imports of complete plants, and especially the grave mistake of the imports during 1978 and 1979, certain quarters have proposed that imports from now on should be mainly in technology, software and prototype machines. We think that this would be a correct direction to follow in future imports, but for the present and the near future, we cannot yet do this. As indicated above, a country cannot subjectively decide what form of imports to take for a particular period. It has to match the country's ability to absorb. The reason industrially developed countries can import patents mostly, even laboratory technology, is because they can absorb these imports quickly and have a higher designing and manufacturing capability. For example, in U.S. industry, one-third of the people are college graduates. In Japan's industry, more than half of the employees are college graduates, of whom about 30 percent majored in science or technology. This makes it possible for them to turn foreign information technology quickly into physical technology for use in production. In China, scientific and technical personnel still represent a small percentage of employees, and the scientific and technical skills of the employees are rather low. By the end of 1979, of the staff members and workers in industrial enterprises owned by the whole people, only 2.9 percent were scientific and technical personnel. Among the 4.7 million scientific and technical people in units owned by the whole people, only 0.8 percent were senior technical personnel. A survey of the 20 million staff members and workers of 23 provinces, centrally administered municipalities and autonomous regions shows that illiterates and semi-illiterates constitute 7.8 percent of the total, primary and secondary school graduates constitute 69.6 percent, and college graduates constitute only 2.9 percent. This means that for the present and the near future we must still mainly import material technology. If we fail to recognize this basic situation and try to hastily convert to importing patents and other information technology, we will not be able to absorb the imports and will suffer losses.

We must also realize that scientific and technical development is not uniform throughout our country. Where conditions permit, we should select a number of better qualified departments and enterprises to import mainly patents and let them become the backbone and the first to accept the transfer of external technology to the country. When they have absorbed the imports and made good progress, we could gradually transfer technology from coastal areas to the interior, from state-owned enterprises to collectively owned enterprises, from military industries to civilian industries, from heavy industries to light industries, and from new industrial sectors to traditional industrial sectors.

We should also correlate technology imports with export trade and foreign affairs activities. We should promote activities that involve less expenses but yield fast results, such as technical discussions, cooperative production, assembly and processing work, compensation trade, technical consultation and study tours.

In short, the form of imports should suit the country's conditions and real needs. We should be flexible and gradually create conditions for the change-over from one form of imports to another. Too hasty a transition is undesirable. Setting one standard for the whole country to follow is impractical.

3. Adopting an equidistant import policy to take advantage of international technological competition. Based on our own experience and that of some other countries, the import of technology should be governed by an equidistant policy, avoiding as much as possible leaning to one side. While there is a close relationship between technology transfer on the one hand and political and economic struggles on the other, we must realize that there is also a difference between them. So in general we should practice an equidistant policy of importing from whoever can provide a more advanced and more profitable technology. This is an effective way to resist monopoly capital's attempt to control us.

4. Resolutely committing ourselves to the development and export of human resources. When formulating the long-term policy on economic development, we must consider both the development of science and technology and the problem of labor and employment, which is a sharp social problem. We must base ourselves on the conditions of our country in formulating a three-in-one long-term policy integrating economics, science and technology, and social problems. In recent years, people have brought up many proposals such as developing processing and assembling work to expand foreign trade, opening up more mineral resources to increase exports, contracting for foreign construction projects to increase labor exports, etc. These are all constructive and feasible proposals. But for our strategic policy, considering the trend of the economic and scientific and technological development in the world and the fact that we have a big population, we should resolutely commit ourselves to the development and export of human resources. Specifically, we should turn population pressure into a motive force for economic development; while actively importing advanced foreign technology, we should increase as much as possible our investment in human resources development, trying our best to improve our own development effort and our ability to absorb foreign technology; we should gradually establish an independent and complete scientific and technological system that is characteristically Chinese, and change from a technology-importing country to a technology-exporting country; and we should, through producing and exporting advanced technology and technology-intensive products, develop our economy, resolve our employment problems, and contribute to the development of science and technology in the world.

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CSO: 4006/338

FOREIGN TRADE

UTILIZATION OF FOREIGN CAPITAL DISCUSSED

Beijing RENMIN RIBAO in Chinese 19 Mar 82 p 2

[Article by Ji Jin [1323 6651]: "Make Active and Careful Use of Foreign Capital"]

[Text] Editor's Note: The use of foreign capital is a new and important issue in our economic construction. How this matter is handled will affect the healthy development of our national industry, as well as the speed of the four modernizations construction. The article printed here, "Make Active and Careful Use of Foreign Capital," is a helpful discussion of the matter worth reading.

The active use of foreign capital is an important element in speeding up our nation's economic construction. Of course, we must be sure to protect our national industry at the same time.

In the utilization of foreign capital, some nations in the world have had obvious success, while some have learned bitter lessons. Using foreign capital well can hasten the development of a nation's industry and strengthen its self-reliance; using it poorly can lead to long-term dependence on certain imported products or to large debts and economic decline. For our nation, the primary question at present is not whether or not to actively utilize foreign capital, but rather how best to use it so as to avoid poor production results. For example, the utilization methods and the conditions attached to various types of foreign loans are different. What sort of loans should we stress? For use in which construction projects? When domestic production is temporarily insufficient, which equipment and materials can be imported to solve pressing construction needs and further the development of domestic industry?

Among the investments in construction projects, foreign capital is utilized mainly in the purchase of foreign machinery and equipment, with approximately 40 percent of all funds going for equipment procurement. If a given construction project utilizes 20 percent foreign capital, then half of its equipment will be manufactured domestically. The degree of self-sufficiency reflected in the amount of domestically produced equipment is determined by the ratio

of domestic investment to foreign capital used. Of the equipment needed for the 156 construction projects of the "first five" [first five-year plan] period, 52.34 percent was domestically manufactured--45.9 percent in terms of rubles. These are historical figures we can use for reference. The first thing is to draw up specific ratios of equipment to be purchased from foreigners to that to be preserved for domestic manufacture based on our nation's technology and equipment policies and domestic manufacturing levels. This is a matter that can only be decided after seriously considering how to proceed in a comprehensive and balanced way.

In formulating plans, large and medium sized construction projects should utilize foreign capital in combination with domestic investment. It is always the case that the equipment required for a given large-scale construction project can be supplied in part from what is manufactured domestically and in part through imports. If in our planning we can stipulate the percentage of foreign capital to be used and then plan accordingly which equipment should be purchased abroad and which should be supplied through domestic production, it will give the units involved and the manufacturing sector something to go by in making choices. If we kept domestic investment separate from the utilization of foreign capital, stipulating which projects were to use foreign capital and which were to be based on domestic investment, then even if the equipment for construction projects using foreign capital could be domestically produced, of a quality adequate to meet requirements and at low prices, because of a lack of funds, it would have to be purchased abroad. And projects that made no allowance in the planning for utilizing foreign capital would find that some equipment could not be adequately manufactured at home and would either be unable to import it or would need to go through level after level of examinations and approvals, which would create tremendous problems. This would limit the flexible utilization of foreign capital--binding us hand and foot.

Tremendously large construction projects which utilize foreign capital must strengthen their basic construction ground work and improve their economic results. From selecting projects to determining loans, we must follow strict procedures and pass through repeated comparisons, cost accountings and justifications. At present, weak basic construction ground work is the basic factor leading to long construction times, a lot of waste and poor economic results. Some construction projects get underway after having just been suggested, without a detailed selection process or any cost accounting. Some of the technological processes and equipment selection on vast projects have not been broadly justified, analyzed and checked for cost effectiveness, and this has resulted in poor economic performance. There are many such lessons to be learned. We should say that in terms of doing things according to the laws of basic construction and doing strong basic construction groundwork, the previous period was a step backward in comparison to the "first five."

Vast construction projects should make every effort to arrange domestic responsibility for overall design, contracting and delivery. Guaranteeing the effectiveness of technological processes is the primary factor relevant to the overall situation which, in conjunction with a comprehensive consideration of the nation's technology policy, resources and related conditions, should

be considered in determining the types of technological processes that a construction project should adopt and the kind of equipment it selects. Because of this, plant design and machine product design are crucial, and we must struggle to take control of these ourselves. If our technological level is low and our experience is insufficient, we can seek aid from foreigners, we can purchase technology, we can hire expert consultants and we can seek advice from specialized foreign firms, but we cannot rely totally on foreign support. The present method of some construction projects which utilize foreign capital of having individual units discuss matters with foreigners while shuffling domestic plant design and equipment manufacturing units to one side must be changed. Practice has proven that the method of completely handing over the keys to foreign firms is unacceptable. "Tuition" must be paid, but afterward we must gain some skills and strengthen our ability to be self-reliant.

At the same time that we utilize foreign capital, we should attach greater importance to raising domestic funds. For the last 2 years, both local foreign currency reserves and the savings of enterprises and individuals have increased. The road to domestic fund raising is wide, and the conditions surrounding the use of domestic funds are more advantageous than those surrounding the use of foreign capital, so this should be given priority consideration. Basic construction and technology transformation projects should primarily make use of bank loans; purchases of large equipment with long turnaround times should utilize seller loans, with the enterprise taking sole responsibility for profits and losses. In our use of foreign capital we should also severely restrict the scope of projects where the state takes on unified borrowing and repayment, and change this method of eating out of the big pot. This will improve economic results; it will lead construction units and machine and electronic manufacturing units to pay more attention to economic results and will produce intimate cooperation between the two.

Machinery and electronic products should have an important place in the foreign purchases of manufacturing technology. The renewal and new generation replacement of machinery and electronic equipment must proceed a step ahead so that it can serve the reform of the technology of the national economy. This requires that we strengthen scientific research and trial manufacturing work. But for the present, we should attach great importance to the purchase of advanced foreign technology because (1) "distant water cannot quench the thirst at hand," and (2) even if we achieve breakthroughs in certain important areas, these cannot be matched in other areas. Expending our energy to research and manufacture everything is both impossible and unnecessary. The industrially developed nations cannot do so. After the war, Japan attached great importance to the adoption of technology, and the machine and electronics industries accounted for more than half of the adopted technologies. As a result, it manufactures a lot of strongly competitive products. We would do well to draw lessons from this experience. At present, some of our systems of financing, banking, tax collection and foreign currency management still encourage the import of complete sets of equipment and limit the adoption of technology, and this situation must be improved.

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FOREIGN TRADE

'JINGJI GUANLI' ON EXPORTING MECHANICAL PRODUCTS

HK201100 Beijing JINGJI GUANLI in Chinese No 3, 15 Mar 82 pp 30-33

[Article by Li Geng [0500 5087]: "Energetically Organize the Exports of Mechanical and Electrical Products"]

[Text] Following three decades of development, our machine-building industry already has a sizable foundation with fairly great potential. But the present situation of the industry is that on the one hand, many enterprises do not have enough production tasks and large amounts of equipment are idle and on the other hand, the level of production, technology and management is fairly low and it fails to accord with market demands both at home and abroad. There are enormous demands for electrical and mechanical products in international markets and therefore actively organizing the machine-building industry to serve international markets will enable us not only to earn more foreign exchange for the country but also, through foreign trade, will help us promote our industry and improve the management and production technology levels of our machine-building industry. These measures not only accord with the present readjustment principles but will also create conditions for future development.

In the past few years, there has been a fairly rapid growth in the foreign trade of our machine-building industry. Not only are the mechanical and electrical products of the industrially advanced regions such as Shanghai and Tianjin competitive in international markets, but the products of some provinces and regions with weaker foundation have also entered into international markets and they have won certain prestige. Take the situations of the industry in Zhejiang Province for example. Over the past few years, the province has been increasingly active in foreign trade activities and has experienced rapid progress in the exports of electrical and mechanical products. The statistics of the machine-building industrial system throughout the province show that at present, more than 70 different types of electrical and mechanical products of the province have been sold to more than 60 countries and regions on the 5 continents. These products are in good demand in their traditional markets of Hong Kong, Macao and Southeast Asia and they have also begun to enter the markets in Latin America and Western Europe. The province's exports of electrical and mechanical products have gradually increased with each passing year; the exports of such products in 1980 were 30 percent higher than 1979 while the figure for 1981 was 60

percent higher than 1980. The volume of transactions at the Guangzhou trade fair last autumn overfulfilled the quotas set by the department concerned by three times. Foreign trade agreements covering considerable quantities have been signed this year; the province's export trend is good.

What should we rely on in expanding the exports of electrical and mechanical products? The following are some shallow views.

(I) Step Up Study and Investigations of International Markets and Acquaint Ourselves With Demands and At the Same Time Take Active Measures To Do a Good Job in Publicizing Products Abroad and Expanding the Influence of Products

In the past, the production plan for the machine-building industry was worked out and assigned by the state while the sales of the products were totally monopolized by the state. Thus for quite a long period, the industry relied on the "iron rice bowl" and "ate out of the same big rice pot." As a result, the industry ignored the needs of the home market while the research work on foreign markets was very weak. Thus without understanding market situations, the industry was not aware of the demands, nor was it able to make progress. During our negotiations with foreign businessmen, we were unable to quote prices, nor were we aware of the reaction of the businessmen following the exports of our products. Objectively speaking, it was because we did not pay much attention to this work. In order to expand the exports of electrical and mechanical products, it is imperative to step up research and forecasting of international markets, change the style of business which is characterized by "waiting for customers" and go out to understand the demands in international markets by actively resorting to various channels to gain a pretty good idea of market situations. Zhejiang Province is mainly relying on the following channels in understanding the international market situations. (1) Stepping up relations with foreign trade departments. For example, the standard component trade in our province received information from a foreign trade department that there was a big demand in international markets for hexagon screw nuts and particularly for the 8 and 3 mm screw nuts and consequently they contacted the department to produce a certain amount of the screw nuts for export. (2) Making use of the opportunities during visits and lectures by foreign businessmen to negotiate over trade goods. In 1981, our provincial machine-building system received more than 140 delegations from over 30 countries and regions. During their visits, some foreign experts and businessmen had technical discussions with factories and discussed trade goods and these activities have a certain role in promoting technical cooperation and in expanding sales of products. (3) Participating in export commodities fair. (4) Holding exhibition and sale fairs and exhibitions in other countries. Last summer, our province held an exhibition in Hangzhou of equipment for small hydro-power stations. It drew a great number of businessmen. A number of foreign businessmen said that they required such products and some negotiated and concluded business at the exhibition. (5) Consulting related foreign reference materials. The Hangzhou electric power equipment factory sent staff to visit technical information centres and libraries in Beijing, Shanghai and Harbin to consult and collect

96 different reference sources from the United States, Britain, Japan, Germany and other countries. These activities helped the factory understand the general international standards for hydroelectric power equipment, find out the differences between China's small hydro-power equipment and foreign standards and the disparity between China's installation and capacity standards and the foreign ones. Thus on the basis of these findings, the factory was able to improve both the designs of their products and their competitiveness. (6) Organizing and sending technical and trade groups for study abroad so as to directly understand the situations of international markets. Last December, our province sent a machinery trading group to Hong Kong to study market situations. During its visit to Hong Kong, the group visited trading companies, factories, electrical and mechanical product markets and major customers, found a number of new customers and solicited the opinions of old customers. Through such activities, the group was able to negotiate more than 40 trade goods, expand trading and promote cooperative trading relations. It has also consequently worked out measures for promoting foreign trade on the basis of understanding market situations and according to the situation, in our provincial export and import work.

In carrying out foreign trade activities, we intentionally invited comrades from related factories to join in so as to closely coordinate with production enterprises, put the enterprises in the first line of competition and enable them to directly combine their production with market demands. Last July, our province arranged for a chain block technical and trading study group from Hangzhou Wulin machinery plant to visit the United States. This group carried out a deep study and investigation of the designs, technology and production processes of the U.S. chain blocks. Both sides also exchanged technical knowhow, held negotiations on the export of a number of chain blocks and exchanged views with regard to long-term trading cooperation. The director of the plant said with deep feeling that by taking part in foreign trade activities, enterprises will be able to directly exchange experiences with foreign technicians, learn from advanced technology, directly take part in negotiations with foreign businessmen and assume economic responsibility, directly understand foreign users' impression of their products and become aware of the situations of their competitors. Thus with a pretty good idea and definite object in view, the enterprises will be in a good position to improve the quality of their products, increase varieties, lower production costs and improve economic effects. The products of this plant have now been sold to more than 50 countries and regions. It exported 1.2 times as many chain blocks in 1981 than in 1980. The contracts for foreign trade that have been signed this year have already surpassed last year's level.

It is very important in foreign trade activities to step up publicity of products. Foreign users are not very aware with what we are producing and this situation shows that our work in publicizing products is not in accord with the needs of international trade. For example, in expanding the publicity and the sales of the products in international markets, it is imperative to compile and print product catalogues; but a number of places still cannot produce good quality catalogues. During the Guangzhou export commodities

fair last autumn, foreign businessmen wanted to see samples of our province's electric welding machines and electric drills; but as we did not display these products, we failed to conclude business even though we quoted the prices of the products. On the contrary, Hangzhou forklift factory displayed its 3-ton forklift at the fair. In accordance with the needs of foreign businessmen, this factory has improved the quality of its products while the color of the products has been changed from orange to pale orange, white and orange. During its demonstration at the fair, the forklift, because of its high maneuverability, was able to be used in many ways, such as revolving, side-moving, horizontal gripping, dumping, series shafting and pushing and towing. Consequently it attracted the interest of foreign businessmen. A businessman from Malaysia ordered more than 50 such forklifts.

(II) Strive to Improve Quality and Strengthen Competitiveness of Products

Quality is vital for the survival of products and it is also a primary condition for the products to win in the competition of international markets. Some of the enterprises that have done a good job in exporting their products said that "high quality is the permit to international markets" and this remark stemmed from their own experiences. Shield brand chains are one of our province's export-oriented famous brand products. In order to catch up with and surpass international advanced levels, the Hangzhou chain plant compared the quality of its products with British Raynold brand chains that are competitive in international markets. It determined the differences between the two products and solved its own problems and thus rapidly improved the quality of its products. Now, two specifications of chains have won state silver medals. A Western European businessman is said to have purchased chains from Japan, Czechoslovakia and Taiwan and compared them with the shield brand chains made in Hangzhou. He found that the shield brand chains were the best and as a result, he went specially to Hangzhou to sign a long-term trade agreement with the plant. The shield brand chains now have already entered Western European markets. In 1981, the plant signed foreign trade agreements with businessmen from West Germany, the United States and France involving a total of more than 40 million yuan while the exports tasks were 1.5 times greater than those in 1980. The Hangzhou Donghai telecommunication instrument and meter plant has been paying great attention to the quality of its products over the past years so as to win the trust of foreign users. It has been working hard to ensure the quality of its products accord with contracts. Once the packaging of 52 cases, each with more than 1,000 pincer-type electric meters had already been completed when it was found that 1 meter was not accompanied by an instruction booklet. The plant's staff reopened all the cases and checked all the meters until they found the one without the booklet. It is a small plant with only 300 staff but as its products are reliable, it has made a great contribution. Its pincer-type meters have been sold to 23 countries and regions, including West Germany, Switzerland and Britain.

In order to improve the quality of the export-oriented products and in accordance with the demand put forth by the first ministry of machine-building, we readjusted our enterprises in a planned way and step-by-step, strengthened

various basic work and checked the quality of products regularly and also at random. At the same time, we informed the enterprises concerned of the opinions of foreign users and customers in a timely way and together with the enterprises we tried to find the reasons for our shortcomings so as to improve quality. The enterprises with many problems in their products have to suspend their production for readjustment and they must meet quality requirements within a certain period. We are now helping enterprises to do a good job in conforming to international standards, collecting and translating reference materials of international advanced standards and in helping them improve their service. We asked enterprises to compare their products with other similar products made at home and abroad so that they will become aware of their differences and will be able to determine their targets for improvement and work out planning for reaching an advanced level.

To ensure the competitiveness of the products in international markets it is imperative not only to produce high quality products but also to offer them in lower prices, with timely delivery and good service. Foreign businessmen are paying great attention to rapid and timely delivery. To them, time is money and contracts are laws and therefore once a contract has been signed it must be strictly implemented. We must regularly educate staff so that they will be aware of their commitments in contracts and the importance of keeping one's words and as a result, they will be able to form the idea of working according to contracts to achieve merit for their motherland. Once we are able to do a good job in this aspect, we will be in a position to improve our competitiveness in international markets.

(III) Expand the Exports of Famous Brand Products In a Big Way and At the Same Time It Is Necessary, In Accordance With the Needs of Customers, to Develop New Products and New Varieties so That More Electrical and Mechanical Products Will Enter International Markets

Our province has a number of high quality, low-priced and traditional special products such as Westlake brand bench drills, flying dove and double doves chain blocks, shield brand chains and electrical and water meters. In order to meet the needs of international markets and expand the sales of products in batches, it is necessary to actively support the enterprises that are producing famous brand products and traditional special products. Priority must be given to arranging the production plans of these enterprises while the supply of raw materials, fuel and electricity for such enterprises and their coordination must be guaranteed. We must also conscientiously help them solve problems in production. The raw materials and accessories that are needed by such enterprises and yet are not available in the country must be imported so as to guarantee that the export tasks are completed in due time. At the same time, in order to coordinate with the readjustment of the machine-building industry and with the purpose of promoting the production of brand-name and special products, it is also imperative to organize some other enterprises to carry out coordination in producing complete sets of equipment so as to form new production forces.

In order to accord with the needs in the development of foreign trade, it is also necessary, according to demand on the international market, to take active measures to improve old products and develop new products so that we will be able to design the type and quantity of products needed by foreign users. We must also spare no efforts in meeting the special needs of our customers. The Xizi-brand electric meters of the Hangzhou instrument and meter plant have been praised by foreign businessmen as comparable to international brand-name products. But this plant was not satisfied with such an achievement. Basing itself on the features of foreign users, it carried out renovation and designed new electric meters with 4 times the overload capacity (1 3-amp meters with a load of 12 amps of electrical current) and "three proofs" (shockproof, explosionproof and dampproof). An American businessman who was visiting the plant happened to see the new products and he asked to place an order right on the spot. The director of the Haimen machine tool plant of Zhejiang Province heard a businessman at the Guangzhou export commodities fair mumbling to himself about not being able to find simple-structured drilling machines at the fair. This businessman was speaking informally, but the director was impressed by the words. The director made further enquiries and when he returned to his plant he organized staff to trial produce simple drilling machines with prices 50 percent lower than similar ordinary ones. When the machines were displayed at the fair, they were welcomed by foreign businessmen.

In order to help enterprises develop new products and study the new products that are urgently needed in foreign markets, we often provide production enterprises with information and ask comrades who have returned from fairs or study tours abroad to explain new situations. When it was learnt that there are many country villas abroad that, because of the development of electric home appliances, need mini water turbogenerators with a capacity of only several kW that are suitable for nearby mountain water (with only several meters peak flow), we organized and supported the relevant factory to design and trial produce mini water turbogenerators with a capacity of 7 kW. With a simple structure, these generators require very little space and can generate electricity with less water volume. They are thus very suitable for the country villas. The Huangyan hoisting machine plant trial produced hand-operated hydraulic pallet trolleys so as to meet the needs of foreign businessmen. Such pallet trolleys can be widely used in workshops, warehouses, railway stations, harbors, goods terminals and other places for forwarding goods and therefore they are most suitable for removing inflammable goods and other goods which can explode easily. In 1980, we exported 75 such pallet trolleys while the foreign trade contracts signed in 1981 covered the delivery of 750 such pallet trolleys.

(IV) In Accordance With the State's Present Foreign Trade System, It Is Necessary to Open Up More Channels and Introduce Flexible Foreign Trade Practices

First, we must undertake exports by ourselves and combine them with the business of the companies in the ports of other fraternal provinces and municipalities. Since our province undertook direct foreign trade in

March 1980, we have established and developed business relations with a dozen countries and regions to successfully improve the export of batches of electrical and mechanical products. The volume of the exports that were directly undertaken by our province in 1980 was 95 percent higher than our plans, while the figure for 1981 was 2.43 times that of 1981, with more than 30 new varieties being exported. In order to expand exports, it is imperative to sell more products through the ports or other provinces and municipalities.

Second, production enterprises must directly engage in foreign trade. The Hangzhou oxygen plant, Hangzhou steam turbine plant and Hangzhou Wulin machine-building plant have become more active in foreign trade activities since they were allowed by the first ministry of machine-building to undertake foreign trade by themselves. These plants so far have established foreign trade relations with more than 30 countries in the world.

Third, we can process products for foreign companies, including various machinery equipment and its parts and assembly products, with materials, blueprints and samples provided by the companies. The standard accessories plants in Pinghu, Hangzhou, Ningpo and Huangyan are processing durable accessories for foreign businessmen while Hangzhou instrument and machinery plant and Ningpo screw plant are processing wood screws. The Hangzhou foundry plant and Lingan valve plant have signed contracts with U.S. businessmen for processing steel casting parts and semifinished valves.

Fourth, we can cooperate in production. Our province has cooperated with West German companies in building big machines such as machines for producing oxygen with capacities of 10,000 and 28,000 cubic meters and high parameter industrial steam turbines. This in turn has provided conditions for our province to sell quality electrical and mechanical products.

Fifth, we can export manufacturing technology. With state approval, the Hangzhou oxygen plant has begun exporting technology for manufacturing fin-type heat exchangers, selling complete sets of technical material for producing fin-type punching machines and dies, four types of punching machines and five types of dies. It has earned foreign exchange to the tune of several hundred thousand German marks. The equipment sold is now operating smoothly in West Germany. Foreign businessmen said that they were very happy to have purchased such good quality punching machines. In 1981, these businessmen again ordered from the plant, two types of machines for processing fin-type parts.

(V) Step Up Leadership Over Exports and Imports and Training of Foreign Trade Cadres, Constantly Improve Business Levels and Learn To Be Good At Doing Business

Following the development of foreign trade, the number of the machine-building enterprises with responsibility for exports will increase and foreign trade activities will also increase. Therefore it is necessary to include the works of exporting and importing machinery on the agenda while the provincial, regional and municipal management departments must set up special

organizations that are responsible for imports and exports and for regular checking. The enterprises with export responsibility must have foreign trade staff for direct negotiations.

Staff training is very important in foreign trade exchanges. Some foreign companies consider the training and selection of staff who are good at selling as an important factor in the success and failures of their business. Now the demand for foreign trade and specialized personnel is higher in both quantity and quality. Therefore it is imperative to step up training of such personnel and do a good job in training cadres. Our method is that, on the one hand we are sparing no efforts to enable our staff to join the foreign trade training courses that are unifiedly run by foreign trade departments and on the other hand, we are relying on our own efforts in running foreign trade and foreign language training courses. In these, our relevant staff will be able to improve their vocational knowledge, management ability and their level of foreign languages. We believe that as long as production departments, trading departments and other departments concerned are able to concentrate their efforts in coordinating, our country will be able to considerably increase its exports of electrical and mechanical products.

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LABOR AND WAGES

LIVES OF PEOPLE IN SHANGHAI REPORTED TO BE IMPROVING

Shanghai JIEFANG RIBAO in Chinese 13 March 82 pp 1, 3

[Article: "The Lives of the People in the Urban and Rural Areas of Shanghai Are Improving Daily--Statistics From Related Departments in the City Make This Clear--But Because of the Relatively Rapid Increase in the Population of the City in Recent Years and the Results of Proportional Imbalances from the Past, There Remain Many Problems in the Areas of Housing, Transportation, Recreation, Medical Care, Public Food Services, Etc"]

[Text] Because of the overall arrangements made by the party and the government in production and construction and in the lives of the people in the course of readjusting the national economy, the material and spiritual lives of the people in both urban and rural areas of this city are improving daily.

The incomes of both rural and urban people have increased. After the smashing of the "gang of four," and especially since the Third Plenum of the 11th Party Central Committee, due to policy measures taken to solve employment problems, to raise the purchase price of farm produce and sideline products, and to adjust wages and increase subsidies--measures for improving the lives of the people--the incomes of the people in both rural and urban areas have increased. According to statistics from concerned departments, in the last 5 years employment has been found for approximately 1.3 million persons throughout the entire city, including unemployed youths and others, centrally placed graduates of middle and higher vocational schools, and discharged military personnel. This means that arrangements were made for an annual average of more than 200,000 persons. The figure for new employment represents approximately one-third of the work force of the entire city (all people and collectives) since the end of 1976. Because of the increase in employment, the number of people that each working individual in the metropolitan area must support has correspondingly declined. According to a survey of 500 working households in the metropolitan area, in 1977 every worker supported 1.74 persons (including himself), and this fell to 1.65 persons in 1981. At the same time, because of the adjustment of workers' wages, the expansion of piece rate wages, the use of bonuses and the extension of subsidies for nonstaple food items, the total amount of workers wages for the entire city in 1981 was 59.7 percent more than in 1976, an annual average increase of 9.8 percent. Among these, those of publicly

owned enterprises increased at a rate of 9.1 percent; and those of the collectives of the cities and towns increased at a rate of 13.7 percent. In 1981 the worker's average monthly wage for the entire city was 37.3 percent higher than in 1976--a real wage increase of 27 percent when adjusted for higher living expenses due to the increase in the price index.

In terms of collectively distributed income, the labor of the three levels (commune, brigade and production team) of the rural people's communes which operate systems of distribution increased 57 percent from 1976 to 1980, an annual average increase of 12 percent. The real income distribution of each able bodied person was 56 percent higher in 1980 than in 1976, an annual average increase of 11.8 percent. According to a separate survey of commune family incomes and expenditures, the average net income from sideline production for each of the surveyed families was 1.4 times more in 1980 than in 1976. In 4 years a total of 480 million more yuan was earned by all county and commune personnel in the city and the outlying areas because of the rise in procurement prices and increased negotiated and above-quota prices. The year 1981 also saw increases in the procurement prices of such products as medicinal materials and pelts, which increased the income of commune workers by approximately 30 million yuan.

According to a 1980 survey of the incomes and expenditures of workers and commune member families, workers households averaged a per capita monthly income of 46.6 yuan, a 110 percent increase over the 1946 figure of 21.8 yuan, and commune workers households had an average per capita net income of 33.5 yuan, a 130 percent increase over the 1946 figure of 14.4 yuan.

Purchasing power has increased. The incomes of people of urban and rural areas has increased, their standard of living has been continually raised and their power to purchase consumer goods was 74.4 percent greater in 1980 than in 1976--61.1 percent greater when compared to 1978. Because of the improvement in the people's lives, the composition of consumption has undergone great changes. In 1981 the power to purchase clothing and daily necessities was respectively 110 percent and 98.9 percent higher than in 1976; for food and fuel the increases were 47.6 percent and 20.3 percent respectively. The proportion of wearing apparel purchases, in terms of total expenditures, rose from 20 percent in 1976 to 24.4 percent in 1981; the proportion of purchases of daily necessities rose from 27.9 to 31.8 percent.

Because workers' income has increased and their lives have improved, the volume of top quality goods and durable consumer goods purchases have continually increased, and so the amount of such goods in the possession of the people is continued to increase. According to a survey of 500 worker families in the metropolitan area, at the end of 1981, on average every 100 households possessed 274 watches, an 8.7 percent increase over 1980; 112 radios, a 13.1 percent increase; 85 sewing machines, a 6.3 percent increase; 70 bicycles, a 7.7 percent increase; 76 televisions, a 29 percent increase; 74 electric fans, a 14.4 percent increase; 17 tape recorders, a 54.5 percent increase; and 10 cameras, a 42.8 percent increase.

In rural areas, according to a survey of 261 commune households, in 1980 "food" items represented 52.8 percent of expenditures. Of this, purchases of staples accounted for 21.9 percent, a 10-percent decline from 1979; secondary food items accounted for 23.5 percent of the expenditures, up 36.1 percent over 1979. This makes it clear that despite the rise in the prices of secondary food items, the quality and quantity of secondary food items consumed in communes has been raised. The extent of the increase in expenditures for "daily necessities" was even greater, up 170 percent in 1980 over 1979. Mostly this involved purchases of bicycles, sewing machines, radios, watches and furniture. "Housing" expenditures have increased the most in recent years. In 1978 "housing" expenditures accounted for only 5.2 percent of expenditures, standing in the last position behind food, clothing, daily necessities, fuel and culture and service expenditures; in 1979 this was up to 13.8 percent, standing in the third position; and in 1980 it stood at 19.9 percent, having risen to second position on the list. In 3 years, expenditures on "housing" increased 550 percent.

After paying for food, clothing and daily necessities, urban and rural people still had money left to save. At the end of 1981, urban and rural people had savings of 3.29 billion yuan, a 110-percent increase over 1976 and an 81-percent increase over 1978.

Collective welfare is being improved. In recent years, in our national income distribution, we have gradually reduced the proportion being set aside, and have speeded up the construction of housing, schools, hospitals, municipal public facilities, commercial, food and service networks, environmental protection, and so forth. The proportion of investment in these areas has increased yearly by great amounts. In 1981, under conditions of great reductions in basic construction, investment in the aforementioned areas was up 230 percent over that of 1976. Of this, investment in housing increased 260 percent over that of 1976. Of this, investment in housing increased 260 percent. In the last 3 years, the floorspace of completed residential construction has totaled 8.17 million square meters, solving and improving housing problems for approximately 1 million persons.

Compared with 1976, in 1981 the use of electricity for lighting in the metropolitan area was up 40.9 percent, household use of gas was up 73.8 percent, and household use of running water was cut 9.7 percent because many residents installed small water meters.

In 1981, the entire city had 3,974 buses and trolleys which carried about 3.6 billion passengers, respective increases of 53.1 and 66.1 percent over 1976.

Compared with 1976, in 1980 the number of kindergartens in the entire city and their enrollments were up 31.4 and 10.9 percent respectively; nurseries and their charges were up 23.2 and 14.8 percent respectively; there were 4.5 percent more hospital beds throughout the city; the retail, food and service networks grew 56 percent; and the area of the city's parks, gardens and green areas was somewhat increased.

Our spiritual lives are gradually being enriched. In the 3 years 1978 to 1980, the books added to every form of library throughout the province amounted to one-fourth of the total books held in 1976. In 1980 the number of movie showings was up 52.4 percent over those of 1976; there were 38.1 percent more of all kinds of books than in 1978; there was a 160 percent increase in the number of magazines; and there was a large jump in the volume of the various newspapers printed.

Although in recent years the lives of the people of Shanghai have been improved in varying degrees, nevertheless because the population of the entire city increased relatively quickly--there being 7.5 percent more permanent residents at the end of 1981 than in 1976 (not including temporary residents, those in transit and those from the surrounding areas who come to Shanghai)--and the proportional imbalances of the past which have left us many problems, the populace still must contend with many problems in the areas of housing, transportation, recreation, medical care, public food service, purchases of merchandise, etc. But such things will gradually be improved along with the further readjustment and development of the national economy, and conditions will get better daily.

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LABOR AND WAGES

PEOPLE'S LIVING STANDARDS IN GUANGDONG SAID TO BE IMPROVING

Guangdong NANFANG RIBAO in Chinese 22 Mar 82 p 1

[Article: "For 3 Years the Lives of the People of the Towns and Cities of Our Province Have Gradually Improved--the Party and the Government Have Adopted a Series of Important Measures"]

[Excerpt] 1. Residential employment figures have increased and the number of family members supported by workers has declined. From 1977 to 1981 throughout Guangdong Province, employment was arranged for more than 1.34 million persons. At present, the workers of the entire province have increased as a percentage of the total population from 10.7 percent in 1978 to 11.5 percent in 1981. According to calculations made from model survey data, in 1981 every family had an average of 2.68 persons employed, 0.86 more than in 1965 and 0.12 more than in 1980; each employed person supported an average of 1.71 persons, 0.97 less than in 1965 and 0.09 less than in 1980. Due to birth control, the family size has decreased, the number of employed persons in families and family incomes have increased, and the average incomes of residents has correspondingly increased. According to calculations based on data from model surveys, households with an average monthly per capita income of less than 35 yuan accounted for 20 percent of the surveyed households in 1981, down from 50 percent in 1980; households with an average monthly per capita income of 35 to 50 yuan increased from 14.3 percent in 1980 to 41.6 percent in 1981.

2. The average income of workers has increased. In recent years, because the state raised part of the workers wages and implemented bonuses and price subsidies, the average incomes of workers have risen relatively quickly. In 1981 the average per capita income of a worker, including money from wages, bonuses and allowances, and price subsidies, was 854 yuan. Compared with 1979 this was a monthly per capita increase of 20 yuan, a total increase of 40 percent or an average annual increase of 11.8 percent. After adjusting for the rise in prices, the worker's real income was 14.8 percent higher than in 1978.

3. The total retail sale of social goods and the volume of wholesale sales of durable consumer goods increased substantially. Because workers incomes increased, their purchasing power increased and the total sales of retail goods also took a big jump. In 1981 the total retail sales of social goods throughout the province reached more than 160.6 billion yuan, 17.7

percent more than the previous year and 63 percent more than in 1978 (among these, the total retail sales of consumer goods increased 69.6 percent), which, after adjustment for the rise in prices, still leaves an increase of 32.8 percent. The sales volume of durable consumer goods, retail sales of which in 1981 were up substantially over 1978, include more than 940,000 bicycles, an increase of 43.6 percent; more than 500,000 sewing machines, an increase of 52.8 percent; more than 1.82 million clocks and watches, an increase of 22.6 percent; more than 170,000 television sets, an increase of 366 percent; and more than 220,000 Typhoon fans, an increase of 185 percent.

4. Investment in housing and in cultural, educational and sanitation welfare has greatly increased. From 1979 to 1981, the state and individual departments and enterprises invested a total of 1.77 billion yuan in completing housing, and this accounted for 23.4 percent of the total completed investments of the entire province, a 274-percent increase over the amount of completed investment in housing from 1976 to 1978. The total increase in housing space in these 3 years reached 13.83 million square meters, and some of the housing conditions of the workers have been improved. In addition, in the last 3 years, the culture and education and the sanitation departments throughout the province have completed investments of more than 420 million yuan, an increase of 240 percent over the previous 3-year period. The major portion of the construction for cultural, educational and sanitation welfare was in towns and cities.

5. The savings in banks of the residents of towns and cities are rapidly increasing. At the end of 1981 the savings of the residents of towns and cities throughout the province exceeded 2.1 billion yuan, up 41.7 percent over 1978. Based on the population of cities and towns, the per capita savings is more than 200 yuan. In 3 years, savings have increased an average of 25.2 percent per year.

6. The state has used a large amount of money to implement various subsidies. For 3 years, direct individual price allowances for workers (including Central Committee, local, state and collective workers) and price subsidies for daily necessities (such as grain, oil, eggs, meat, vegetables, etc) and for products which support agricultural production have reached 1.8 billion yuan.

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